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A handwritten signature in dark ink, appearing to read "G. Graham-Cumming". The signature is stylized with a large, sweeping flourish at the end.

G. Graham-Cumming,
Medical Liaison Officer,
Medical Services.

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DEPARTMENT OF NATIONAL HEALTH AND WELFARE

MEDICAL SERVICES

MATERNAL AND CHILD HEALTH SURVEY 1962

CANADIAN INDIANS

Intention of survey

This survey was undertaken with a view to studying the characteristics of infant mortality amongst registered Canadian Indians, attempt to determine what factors were producing the high rates of mortality recorded annually and measure as far as possible the degree of utilisation of the medical services available and the influence this was having.

Method

A questionnaire was prepared, a copy of which is appended, which the public health nurses in the Federal Medical Services were asked to answer for each birth occurring amongst the Indians resident in their districts during the calendar year January to December 1962. This entailed following the child from birth to the first birthday and also recording the pre-natal experience of the mother prior to the birth. Consequently the questionnaire could not be completed until after December 31st 1963. The data reported was then coded and transferred to electronic tape and analysed by computers of the Central Data Processing Service.

CHARACTERISTICS OF INDIAN BIRTHS

Birth rate

Reports were made on 5,598 births. Actually, in 1962, 7,854 Indian births were registered so this study covers only 71% of all Indian children born that year. This, however, is probably not so great a deficiency in coverage as it may seem. Other studies have shown that not 74% of registered Indians can ever be found on the reserves at any given time. Births occurring amongst the 21 to 23% of Indians permanently absent from their reserves would not readily come to the notice of the Federal Service nurse nor would it be practical for them to visit or follow up such children. The 71% of all births reported then probably does represent fairly complete coverage of all Indian births to mothers actually living on reserves. Estimated on the total mid-year Indian population in 1962, of 195,099, the total 7,854 births registered gave a crude birth rate of 40.26 per 1000 population and, on the 2031 total deaths reported that year, a vital index of 3.86, this in spite of an infant mortality rate of 74.87. The exact "population at risk" was not ascertained in this study but from other studies, can be estimated to be not greater than 73% of the total estimated mid-year population, in which case the 5,598 births reported give a birth rate of approximately the same order, 39.30 per 1000 mid year population, considerably above the Canadian national birth rate.

Fertility of Indian Women

In attempting to estimate the crude fertility rate, as the births covered in this study comprised only 71% of births registered in 1962 and it had been found in another study that only 73% of the officially registered Indian population actually live on Indian reserves, the female

population "at risk" was estimated as 73% of the mid year population. The result is a crude fertility rate of 208 per 1000 women aged 15-44. Births to mothers under 15 and over 44 are excluded. This is lower than the officially estimated rate for 1962 based on all registered births and the total registered population. That rate however included all those births born to women under 15 and over 44, a factor which had not previously been estimated, and was based on the population of women between those ages only. It is now known that this factor constituted at least 1% of the births, nearly 800 additional births, which should properly have been excluded. The rate of 208 is therefore probably a closer approximation to the true fertility rate than the official figure. It cannot be compared directly with the national fertility rate, however, as that rate is calculated on a somewhat different basis. This crude rate of 208 births per 1000 women aged 15-44 years would suggest that slightly more than every fifth woman in that age range bore a child in 1962 or that, on the average, every Indian woman bears between 6 and 7 children during her life. This is almost twice as many as the average Canadian female.

Age specific fertility rates

As might be expected, fertility showed a definite age specificity, being extremely high among young Indian women, tapering off as age advanced but still remaining surprisingly high amongst women aged 40-44, practically every tenth Indian woman of those ages apparently having given birth to a child in 1962. The fertility rate for girls aged 15 and 16 appears low but girls of that age are not, as a rule, expected to bear children. That the rate for sixteen year olds was 50 per 1000 girls of that age is highly significant, indicating that 1 in every 20 Indian girls of that age bore a child in 1962 almost certainly out of wedlock. The fertility of girls age 18 and 19, who are more likely to be married, approximated to 200 or practically the overall rate for all Indian women, i.e. every fifth girl of those ages had a baby. Between the ages of 20-29, the rate rose to 300, indicating that nearly every third woman gave birth to a child in 1962. The most prolific age was 25 with 333 births per 1000 of women of that age, exactly every third woman. After 30 the fertility rate begins to drop but not very fast, still being nearly 260 for women aged 30-34 and still over 200 for women aged 35-39. Indian women begin to bear children very early in life and continue to bear them at a high rate until well after 45.

For planning purposes, it is well to keep the age specific fertility rates in mind as the age distribution of the female population will affect the workload. In any group of Indians having a high percentage of women under 30, a very high birth rate is to be anticipated under normal circumstances. On the above figures, it would seem wise to plan on the basis of 2 births per annum for every 10 women aged 18 and 19 in the population, 3 births per annum for every 10 women aged 20-29, 2.6 births per annum for every 10 women aged 30-34, 2 per annum for every 10 women aged 35-39 and 1 per annum for every 10 women between 40 and 45. The picture presented above could, however, be drastically modified should the use of oral contraceptives become widespread and the current situation requires to be kept constantly under review locally.

Distribution of births by Regions and Zones

Indian birth rates are not uniform over the geographical regions and zones in Canada. There is a definite concentration of births in the prairie regions, particularly in Saskatchewan. This has been noted in previous studies. In this study, the large Eastern Region, in which over 38% of all registered Indians live, contributed only 28% of the total births reported while Saskatchewan, in which only 14% of all Indians reside, contributed 17% of all births, one zone in Saskatchewan, Fort Qu'Appelle, alone contributing 10% of all reported births. British Columbia, in which 20%

Maternal and Child Health Survey 1962
Age Specific Crude Fertility Rates

Age of Mother	Estimated Female Population	Actual Numbers		Age-Specific Crude Fertility Rate per 1000 Women	
		Born Alive	Total born	Live Births	Total Births
15	1,533	26	26	17	17
16	1,447	73	73	50	50
17	1,403	151	152	108	108
18	1,358	195	196	144	144
19	1,336	279	282	209	211
15-19	7,076	724	729	102	103
20	1,212	312	313	257	258
21	1,166	306	308	262	264
22	1,146	332	334	290	291
23	1,100	330	330	300	300
24	1,006	309	313	307	311
20-24	5,630	1,589	1,598	282	284
25	913	303	304	332	333
26	912	273	275	299	302
27	909	265	265	292	292
28	895	267	267	298	298
29	845	235	236	278	279
25-29	4,474	1,343	1,347	300	301
30	815	229	234	281	287
31	750	202	207	269	276
32	732	184	186	251	254
33	711	152	152	214	214
34	679	168	173	247	255
30-34	3,687	935	952	254	258
35	664	156	157	235	236
36	613	131	134	214	219
37	665	120	120	180	180
38	611	126	128	206	209
39	560	105	105	188	188
35-39	3,113	638	644	205	207
40	565	71	71	126	126
41	544	65	65	119	119
42	522	60	62	115	119
43	465	30	30	65	65
44	440	16	16	36	36
40-44	2,536	242	244	95	96
Total	26,516	5,471	5,514	206	208

Male: Female Ratio at birth by Regions and Zones

Region or Zone	Live births reported			Possible Male Births			Possible Female Births			Male : Female Ratio at Birth			
	Male	Female	Sex Unknown	Maximum	Mean	Maximum	Mean	Maximum	Mean	as reported	Maximum	Minimum	Mean
Coqualeetza.....	247	244	5	252	250	249	246	1,033	1,012	992	1,016		
Nanaimo.....	153	151	14	167	160	165	158	1,106	1,013	927	1,013		
Miller Bay	37	33	10	47	42	43	38	1,424	1,121	860	1,105		
Pacific Region	437	428	29	466	452	457	442	1,089	1,021	956	1,023		
Yukon.....	42	32	5	47	45	37	34	1,469	1,313	1,135	1,324		
Mackenzie	120	111	12	132	126	123	117	1,189	1,081	976	1,077		
North Alberta.....	234	227	37	271	253	264	246	1,194	1,031	886	1,028		
South Alberta.....	196	157	4	200	198	161	159	1,274	1,248	1,217	1,245		
Foothills Region.....	592	527	58	650	621	585	556	1,233	1,123	1,012	1,117		
Prince Albert.....	105	104	6	111	108	110	107	1,067	1,010	955	1,009		
North Battleford	60	87	9	69	65	96	92	793	690	625	707		
Fort Qu'Appelle	287	226	34	321	304	260	243	1,420	1,270	1,104	1,251		
Saskatchewan Region.....	452	417	49	501	477	466	442	1,201	1,084	970	1,079		
South Manitoba	133	103	4	137	135	107	105	1,330	1,291	1,243	1,286		
Sioux Lookout	133	118	7	140	137	125	122	1,186	1,127	1,064	1,123		
The Pas.....	29	52	3	32	31	55	53	615	558	527	585		
Norway House.....	154	140	15	169	162	155	148	1,207	1,100	994	1,095		
Central Northern	31	30	3	34	33	33	31	1,133	1,033	939	1,065		
Central Region	480	443	32	512	496	475	459	1,156	1,084	1,011	1,081		
Eastern Arctic.....	74	78	4	78	76	82	80	1,000	949	902	950		
Northern Ontario.....	128	142	22	150	139	164	153	1,056	901	780	908		
James Bay.....	139	104	16	155	147	120	112	1,490	1,337	1,158	1,313		
Southern Ontario.....	267	246	9	276	272	255	251	1,122	1,085	1,047	1,084		
Quebec.....	102	89	13	115	109	102	95	1,292	1,146	1,000	1,147		
Atlantic	57	67	0	57	57	67	67	851	851	851	851		
Eastern Region.....	767	726	64	831	799	790	758	1,144	1,056	971	1,054		
All Regions.....	2,745	2,556	251	2,996	2,871	2,807	2,682	1,172	1,074	978	1,070		
Unidentified.....	17	15	19	36	26	34	25	2,400	1,133	500	1,040		

Maternal and Child Health Survey – 1962
Births and Mortality Rates by Regions and Zones

Region or Zone	Actual Numbers Reported										Mortality Rates				
	Total Births	Born Alive			Still born	Died during First Year			Fate unknown	Stillbirths per 1000 total births	I.M.R. per 1000 live births				
		Male	Female	Sex unknown		Total	Male	Female			Sex unknown	Total	Male	Female	Total
Coqualeerza	500	247	244	5	496	4	21	15	1	37	0	8	85	61	75
Nanaimo	320	153	151	14	318	2	14	7	2	23	0	6	92	46	72
Miller Bay	80	37	33	10	80	0	1	4	1	6	0	0	27	121	75
Pacific Region	900	437	428	29	894	6	36	26	4	66	0	7	82	61	74
Yukon	79	42	32	5	79	0	4	4	0	8	0	0	95	125	101
Mackenzie	245	120	111	12	243	2	29	11	0	40	1	8	242	99	165
North Alberta	501	234	227	37	498	3	17	19	6	42	0	6	73	84	84
South Alberta	361	196	157	4	357	4	13	9	1	23	0	11	66	57	64
Foothills Region	1,186	592	527	58	1,177	9	63	43	7	113	1	8	106	82	96
Prince Albert	217	105	104	6	215	2	21	13	3	37	0	9	200	125	172
North Battleford	160	60	87	9	156	4	9	15	0	24	0	25	150	172	154
Fort Qu'Appelle	557	287	226	34	547	10	24	20	2	46	1	18	84	88	84
Saskatchewan Region	934	452	417	49	918	16	54	48	5	107	1	17	119	115	117
South Manitoba	242	133	103	4	240	2	10	4	0	14	0	8	75	39	58
Sioux Lookout	258	133	118	7	258	0	15	6	1	22	1	0	113	51	85
The Pas	86	29	52	3	84	2	2	6	0	8	0	23	69	115	95
Norway House	310	154	140	15	309	1	7	8	3	18	0	3	45	57	58
Central Northern	64	31	30	3	64	0	2	1	0	3	0	0	65	33	47
Central Region	960	480	443	32	955	5	36	25	4	65	1	5	75	56	68
Eastern Arctic	156	74	78	4	156	0	6	7	2	15	1	0	81	90	96
Northern Ontario	292	128	142	22	292	0	3	7	1	11	0	0	23	49	38
James Bay	263	139	104	16	259	4	17	9	4	30	0	15	122	87	116
Southern Ontario	526	267	246	9	522	4	9	10	0	19	0	8	34	41	36
Quebec	206	102	89	13	204	2	3	4	0	7	0	10	29	45	34
Atlantic	124	57	67	0	124	0	1	1	0	2	0	0	18	15	16
Eastern Region	1,567	767	726	64	1,557	10	39	38	7	84	1	6	51	52	54
All Regions	5,598	2,745	2,556	251	5,552	46	234	183	27	444	4	8	85	72	80
Unidentified	51	17	15	19	51	0	6	3	0	9	0		meaningless		

Percentage Distribution of Births and Deaths by Regions and Zones

Region or Zone	Total births	Born alive			Still born	Died during First Year				Fate Unknown
		Male	Female	Sex unknown		Male	Female	Sex unknown	Total	
Coqualeetza	9	9	10	2	9	9	8	4	8	0
Nanaimo	6	6	6	6	4	6	4	7	5	0
Miller Bay	1	1	1	4	0	0	2	4	1	0
Pacific Region	16	16	17	12	13	15	14	15	15	0
Yukon	1	2	1	2	0	2	2	0	2	0
Mackenzie	4	4	4	5	4	12	6	0	9	25
North Alberta	9	9	9	15	7	7	10	22	9	0
South Alberta	6	7	6	2	9	6	5	4	5	0
Foothills Region	21	22	21	23	20	27	23	26	25	25
Prince Albert	4	4	4	2	4	9	7	11	8	0
North Battleford	3	2	3	4	9	4	8	0	5	0
Fort Qu'Appelle	10	10	9	14	22	10	11	7	10	25
Saskatchewan Region	17	16	16	20	35	23	26	18	24	25
South Manitoba	4	5	4	2	4	4	2	0	3	0
Sioux Lookout	5	5	5	3	0	6	3	4	5	25
The Pas	2	1	2	1	4	1	3	0	2	0
Norway House	6	6	6	6	2	3	4	11	4	0
Central Northern	1	1	1	1	0	1	1	0	1	0
Central Region	17	17	17	13	10	15	14	15	15	25
Eastern Arctic	3	3	3	2	0	3	4	7	3	25
Northern Ontario	5	5	6	9	0	1	4	4	2	0
James Bay	5	5	4	6	9	7	5	15	8	0
Southern Ontario	9	10	10	4	9	4	5	0	4	0
Quebec	4	4	3	5	4	1	2	0	2	0
Atlantic	2	2	3	0	0	0	1	0	0	0
Eastern Region	28	28	28	25	22	17	21	26	19	25
All Regions	100	100	100	100	100	100	100	100	100	100
Unidentified	1	1	1	8	0	3	2	0	2	0

of Indians reside, contributed only 16% of all births but the large Foothills Region, which included the Yukon and Mackenzie District and in which 14% of all Indians live, contributed 21% of the births reported. Central Region, comprising the province of Manitoba and that area of the Northwest Territories to the north of that province, houses 14% of the Indian population but contributed 17% of the births. As regards the zones within the larger regions described above, in addition to the outstanding performance of the women in the Fort Qu'Appelle Zone, three other zones made outstanding contributions, Coqualeetza in the Pacific Region (British Columbia), Northern Alberta and Southern Ontario, each contributing about 9% of all births. Southern Ontario, however, is much the most densely populated zone in Canada and, on population alone, might have been expected to make a much greater contribution. These four zones alone, however, out of the 21 zones, provided 37% of all the births reported.

Sex ratio at birth

The sex of 251 infants was not reported. Eastern Region failed to determine the sex of 64 children, Foothills Region 58, Saskatchewan 49, Central Region 32 and Pacific Region 29. In 19 cases even the Region to which the birth should be allocated could not be determined. Fort Qu'Appelle was again the zone most outstanding for failure to determine the sex of 34 children. Only in the Atlantic Zone was it possible, apparently, to tell all the boys from the girls. This deficiency in data makes it difficult to determine any sex ratio at birth with confidence. By assuming, however, that all unreported sexes were, on the one hand male, or on the other hand, all female, it is possible to arrive at a possible maximum ratio and a possible minimum ratio of males to females, the maximum being 1172:1000 females and the minimum 978:1000 females. The ratio among the births of known sex was 1074:1000 females and, if the means of the possible maxima and minima of each are taken, the mean sex ratio at birth was 1070 per 1000 female births. In previous studies the Indian male:female ratio at birth has usually been found to be around this figure so it can be assumed with reasonable assurance that sex was distributed among the children of unreported sex in much the same proportion as amongst the children whose sex was determined and accordingly ratios have been calculated on this assumption.

Because of the notoriously greater vulnerability of the male zygote than the female to all adverse factors, a drop in the male to female sex ratio at birth can be a sensitive index to unsuspected trouble manifesting itself in damaging the males before its effects can be readily observed among the females. It is interesting to note, therefore, that the sex ratio at birth amongst British Columbia Indians (who also have a relatively high infant mortality rate) is surprisingly low. This has been noted over several years in annual reports and appears to be a consistent finding. The national male:female sex ratio at birth for Canadians as a whole is usually around 1050:1000. Indians as a whole generally seem to have a higher male-female ratio, possibly a function of a higher ratio of very young mothers but, by taking the national ratio as a "standard", Indians in the Eastern Region have a "normal" sex ratio at birth, a consistently low sex ratio at birth in the Pacific Region, an unusually high ratio in the Foothills Region and ratios of around 1080:1000 in Saskatchewan and Central Regions. While the number of births involved in any one zone and the range of possible error (as shown by the range of maximal and minimal possibility) make comparison of zone ratios somewhat questionable, it is interesting to note there does seem to be a tendency for the male:female sex ratio at birth to be high in southern zones and lower in northern zones. Thus, in Southern Alberta, Southern Saskatchewan, Southern Manitoba, Quebec, Southern Ontario and Sioux Lookout, the ratio was high while in Prince Albert and North Battleford in Northern Saskatchewan, the Pas in Northern Manitoba, the Eastern Arctic, Northern Ontario and the Atlantic Zone, it was low, actually falling below parity

in North Battleford, the Pas, Eastern Arctic, Northern Ontario and Atlantic Zones. The Yukon and James Bay ratios seem to contradict this general pattern, even the minimum possible ratio being high, but the numbers of births involved are small and too sensitive to chance. The range of possibility at Miller Bay could have been any ratio between 1424:1000 and 860:1000 but it is interesting and suggestive that the ratios in Coqualeetza and Nanaimo Zones should appear to be so surprisingly low. Even at the maximum of its possible range, the Coqualeetza sex ratio at birth is well below national ratios. The further north one goes, the more rugged and severe the environment tends to become and a drop in the male to female ratio at birth would not be surprising but, in Coqualeetza Zone in particular, the low ratio hints that some other adverse factor or factors must be reducing the number of males brought successfully to birth and these same factors may also be instrumental in maintaining the abnormally high mortality in the months following birth.

CHARACTERISTICS OF INDIAN INFANT MORTALITY

Average age at death

Time of death	Numbers dying	Days lived (on average) by each child	Total days lived
1st day	74	0.5	37
Under 1 month	85	15	1275
" 2 months	49	45	2205
" 3 "	44	75	3300
" 4 "	36	105	3780
" 5 "	34	135	4590
" 6 "	28	165	4620
" 7 "	27	195	5265
" 8 "	16	225	3600
" 9 "	12	255	3060
" 10 "	12	285	3420
" 11 "	15	315	4725
" 12 "	<u>12</u>	345	<u>4140</u>
During the year	444		44017

If 444 infants born in 1962 died during the first twelve months of their lives, having lived between them 44,017 days, then the average at death of one infant was 99.13 or just over three months.

Mortality at birth

As already noted, 46 deaths or just over 10% of the total loss of infant life in the twelve month period, occurred just prior to or during birth, i.e. the stillbirths, but a further 74 children died within 24 hours of birth, making the total loss 120 or nearly 25% of the total loss of infant life, a mortality rate of 21.44 per 1000 births. Thus despite the fact that over 80% of the deliveries were managed by professional personnel and, for the most part, under satisfactory obstetrical conditions, no less than one quarter of the total loss of infant life in the year occurred at or immediately around the time of birth.

Neonatal mortality

In addition to the 74 children dying in the first day of life a further 85 died during the first four weeks of life, making a total of 159 or 32.5% of the total loss of infant life, almost one third and giving a neonatal mortality rate of 28.62 per 1000 live births. Thus 42% of the total loss of infant life occurred before the end of the first month of life.

Mortality from second to sixth month of life

After the first month mortality among the survivors began to drop steadily and fairly rapidly. Just over 93% of children born were still living at the end of the sixth month but 396 out of the total 490 deaths had occurred before that time, over 80% of the total loss of infant life. Amongst Canadian children as a whole some 60-66% of the loss of infant life generally occurs during the first six months of life. Even excluding the stillbirths, out of the 444 children dying in the year 350 or just under 80% died before they were six months old. Mortality among children who lived for longer than six months dropped off very significantly. During the third month of life the infant mortality was at the rate of about 8 per 1000 living, as compared with 29 in the first month of life, during the sixth month of life it was 5 per 1000 living and during the ninth month it fell to 2.33 per 1000, at which level it remained for the rest of the year, the slight rise appearing in the eleventh month not being statistically significant.

Chances of survival and death

At birth an Indian infant had just barely better than 9 chances in 10 of reaching his first birthday and the chances that he would become a casualty before then were 9 in 100. The chances that he would die before he was one month old were nearly 3 in 100. If he survived to his second month, the risk of dying dropped to 1%, in the third month to 0.8% then to 0.7%, 0.6%, 0.5% in the fourth, fifth and sixth months respectively. Thereafter the risk dropped rapidly to 0.3% from the ninth month onward. The need to achieve better control over more Indian babies during the first month of life is obvious.

MORTALITY BY REGIONS AND ZONES

Stillbirths

The number of stillbirths reported was 46, giving a stillbirth rate of 8 per 1000 births. As the stillbirth rate for Canada as a whole is over 12 per 1000 births, this low rate probably indicates under reporting rather than any gratifying state of affairs amongst Indians. It is noteworthy that Saskatchewan alone reported 35% of all stillbirths and there the stillbirth rate was 17 per 1000 births while, amongst the 557 births in the Fort Qu'Appelle Zone, the stillbirth rate was 18 per 1000 births. In Southern Alberta which enjoys good maternal supervisory services and has, for Indians, a relatively low infant mortality rate, the stillbirth rate was 11 per 1000 births. The true Indian stillbirth rate is most probably higher than the national rate, not lower.

Infant mortality

The number of children dying during the first year of their life was reported as 444, giving a mortality rate of 80 per 1000 live births. This is a higher figure than previously estimated for 1962 as mentioned under the paragraph on general observations. The official rate for that year was 74.87. The higher rate, however, probably does reflect more accurately the state of affairs on the reserves as the lower rate is diluted by the number of births to Indians living off reserves, particularly in the eastern provinces where other previous studies have shown that not only Indian infant mortality rates but birth rates, death rates and fertility rates all approximate quite closely to the rates reported from the white populations of those areas. This high rate of 80 per 1000 live births was exceeded in Prince Albert Zone (172), the Mackenzie Zone (165), North Battleford (154), James Bay (116), the Yukon (101), the Eastern Arctic (96),

Maternal and Child Health Survey 1962
Survival and Mortality by Duration of Life

Period	Numbers		Percentage Distribution		Changes per 100,000 of	
	Born or Surviving	Dying during the period	Born or surviving	Dying during the period	Surviving during the period	Dying during the period
At birth	5,598	46	100.0	9.4	99,178	822
On 1st day.....	5,552	74	99.2	15.1	98,667	1,333
2nd - 30th day.....	5,478	85	97.9	17.4	98,448	1,552
31st - 60th day	5,393	49	96.3	10.0	99,091	909
61st - 90th "	5,344	44	95.5	9.0	99,177	823
91st - 120th "	5,300	36	94.7	7.4	99,321	679
121st - 150th "	5,264	34	94.0	6.9	99,354	646
151st - 180th "	5,230	28	93.4	5.7	99,465	535
181st - 210th "	5,202	27	92.9	5.5	99,481	519
211st - 240th "	5,175	16	92.4	3.3	99,691	309
241st - 270th "	5,159	12	92.2	2.4	99,767	233
271st - 300th "	5,147	12	91.9	2.4	99,767	233
301st - 330th "	5,135	15	91.7	3.1	99,708	292
331 st - 365th"	5,120	12	91.5	2.4	99,766	234
by 366th day	5,108	490	91.2	100.0	91,247	8,753

The Pas (95), all northern zones with severe climatic conditions and communications difficulties and also, slightly but not significantly, in the Sioux Lookout area, Northern Alberta and Fort Qu'Appelle. In Northern Alberta a high rate would not be unexpected because of local conditions but better results might have been looked for in the other two southern zones. Low rates were reported from the Atlantic Zone (16), Quebec (34), Southern Ontario (36), Northern Ontario (38), and, surprisingly, the Central Arctic (47). However, both in the Atlantic Zone and in the Central Arctic, the figures involved are really too small to give much significance to the rates, one death more or less would produce quite dramatic fluctuation. Comparing the Regions, Saskatchewan reported much the highest infant mortality (117) a truly shocking wastage of infant life, Eastern Region much the lowest (54), still twice the national rate but gratifying by Indian standards. The rate was high in the Foothills Region at 96 but relatively moderate, for Indians, in the Central Region at 68. In British Columbia, where something better might well be expected, the rate was surprisingly high at 74 which, while below the Indian average of 80, is still an excessively high rate in an area with so many natural and other advantages. It is difficult to understand why British Columbia Indians lag so far behind Indians in Ontario and Quebec. All zones in British Columbia reported almost identical rates.

Percentage distribution of infant mortality by Regions and Zones

Foothills Region, which contributed 21% of the births, contributed 25% of the infant deaths. Saskatchewan, however, with 17% of all births, contributed 24% of the deaths so that nearly half the deaths occurred in these two Regions alone among slightly more than one third of the births. Central Region, which also contributed 17% of the births, contributed only 15% of the infant deaths as did also the Pacific Region but, in this case, out of only 16% of the births. The large Eastern Region, which contributed 28% of births, provided only 19% of the infant deaths despite the inclusion of the Eastern Arctic area. As regards individual zones, Fort Qu'Appelle alone contributed 10% of all infant deaths as well as 10% of all births and stands out as the worst zone in this respect. Northern Alberta came next with 9% of both births and deaths but was better than the Mackenzie Zone which contributed 9% to the infant deaths out of only 4% of the births. Prince Albert, which also contributed 4% of the births, added 8% of the infant deaths and James Bay Zone, out of a 5% contribution to the births, provided another 8% of the deaths. Coqualeetza Zone added yet another 8% of the deaths out of 9% of the births so that these six zones alone out of the 21 contributed over half (53%) of all the infant deaths. Other zones by comparison individually made relatively small contributions to the total infant mortality. While infant mortality appears to be coming under reasonable control in the eastern provinces, it obviously remains a major problem in the west and north and especially amongst prairie Indians in Saskatchewan and Alberta.

FACTORS INFLUENCING BIRTHS AND LOSS OF INFANT LIFE

Calendar month of birth, births and infant mortality

There was a slight tendency towards greater concentration of births in the first six months of the year, during which period births are very regularly distributed at about 500 per month, with a tailing off towards the end of the year, December showing the lowest number of births. The peak month for births was March. Infant mortality tended to be higher during the first quarter, especially in March but showed a second peak in July. It was surprisingly low in December. Stillbirths peaked in the fourth quarter, principally in October but had a second peak during the second quarter. In 45 births the date of birth was not ascertained i. e. in less than 1% of births.

Mother's age, births and infant mortality

At the two extremes of childbearing age, it is interesting to note that 16 mothers were under the age of 15 years while 47 women over the age of 45 years gave birth, almost 1% of all births. It is not without significance also that 13% of all births were to girls between 15-19 years of age. The highest percentage of births was, as might be expected, to mothers aged 20-24 years. Two thirds of all births were to mothers under the age of 30 years. The greatest concentration of stillbirths was among mothers aged 30-34 years. This age group also showed the highest stillbirth rate, except for the over 45 year old group, amongst whom 2 stillbirths gave a rate of 43 per 1000 births. Both the stillbirth rates and the infant mortality rates were minimal among mothers aged 25-29. Among the children born to girls under 15 years, no stillbirths and no infant mortality was reported. It is possible these very young mothers received rather special attention. Mortality amongst children born to teenage mothers as a whole, however, both stillbirths and infant mortality was strikingly high, especially amongst children of 16 and 17 year old mothers. Thereafter the infant mortality rate trended downward to a low of 45 among children born to mothers aged 27 years then rose as age advanced, being 83 for children born to mothers aged 20-24, 68 among the children of 25-29 year old mothers as a group including the low point then 77 among the children of 30-34 year old mothers, 85 among those of 35-39 year old mothers and 91 for the children of 40-44 year old mothers, finally peaking at 111 among the children of mothers over 45. The stillbirth rate did not follow the same pattern. It was high (11) among the children of teenage mothers, rose to 13 among births to mothers aged 20-24 years, dropped sharply to 3 among births to mothers aged 25-29, rose very sharply to 18 among births to 30-34 year old mothers then dropped between ages 35-44 only to peak sharply again among the children of elderly mothers over 45. This rate is of course unreliable, involving as stated, only 2 deaths but it is understandable that elderly women might well have more difficulty in safely delivering a healthy child. On the above data, clearly the optimum ages to bear children are between 25 and 29 years. Women of lesser or greater age would seem to stand in need of greater attention. It is interesting, too, that among births to women in this age group, 25-29 years, the sex ratio at birth was around the Canadian national norm but below the unusually high Indian norm. The male to female ratio at birth tended to be very high among younger mothers and it is probable the preponderance of very youthful mothers in the Indian situation affects the ratio. The number of male children born in relation to female children tended to fall as age advanced and was lowest among the children of mothers over 45. This is understandable in terms of increasing difficulty in bringing a conception safely to birth as age advances. Both males and females are affected but males more than females. Young healthy mothers are much less liable to early abortions and more likely to bring any child conceived safely to birth and young Indian mothers in this study certainly gave birth to a remarkably high proportion of male children whereas the mothers over 30 years of age tended, in general, to have proportionally fewer male children.

Marriage status of mother, births and infant mortality

At least 22% of all Indian births were to unmarried mothers, only 74% were to officially married women and another 2% to women living in common law relationship who might be considered "married" for practical purposes. The percentage of births to unmarried mothers in Canada as a whole is currently about 5%. The Indian illegitimacy rate is therefore very high, at least four times the national rate. Widowed, separated and divorced women contributed 99 births, less than 2% of the total, most of whom should probably be added to the illegitimate births.

The infant mortality rate amongst children of unmarried mothers was 90 per 1000 live births as compared with 78 per 1000 live births to married women. The stillbirth rates did not differ significantly. A greater disparity in mortality rates might have been expected but it is known that illegitimate children among Indians are not at quite the same social disadvantage as other illegitimate children and are less often denied the advantages of a fairly normal home, the parents or grandparents of the mother frequently readily adopting the baby. Even so, illegitimacy did affect adversely the child's chances of survival. Youth and inexperience are probably the major factors producing this effect. Unmarried Indian mothers, despite Indian tolerance, like unmarried mothers everywhere, stand in need of special attention.

Birth rank of child, births and infant mortality

It is noteworthy that, whereas 14% of all births were to primipara, 17% were to mothers who had had eight or more previous pregnancies. This is a remarkably high proportion of supermultipara. An attempt was made to ascertain how many of these previous children were still alive but the data on this were so incomplete no meaningful analysis could be made. Second children constituted another 14%, third children 11% and fourth children 12%, which, together with the firstborn made up over half the total births. Fifth, sixth, seventh and eighth children together comprised less than one third. Mortality amongst sixth children was markedly high and surprisingly low among fourth and eighth children but did not really differ at all significantly. Stillbirths, however, were much commoner in sixth and higher birth ranks, the rate for all birth ranks above sixth being 15 per 1000 births. This would seem to suggest that, after a fifth birth, the difficulties in bringing a child safely to birth markedly increase. 30% of stillbirths occurred amongst the births to women with eight or more pregnancies. The stillbirth rate amongst primipara, as compared with second, third, fourth and fifth children, was relatively high. The 14% of births first born contributed 13% of the stillbirths and 15% of the infant mortality. The infant mortality rate for this group was 85 per 1000 live births, an extremely high rate for children born presumably to young healthy mothers. The lack of much variation between the mortality rates for the different birth ranks would suggest that environmental rather than congenital factors maintain the high infant mortality and largely obscure any effect birth rank per se may have. The death rate amongst second children, for example, which is usually less than amongst first children as a result of growing experience, was actually higher. The sex ratio at birth is possibly a slightly better index to where the greater hazard lies. Amongst first, second, third and fourth children the ratio of males born to females was markedly high but from the fifth birth onward it was markedly low, indeed, on the overall figures, below parity, 1345 males to 1370 females. This was a very striking difference which would seem to suggest that a mother's chances of bringing a male child to birth drop dramatically after four pregnancies. This, together with the rapid rise in the stillbirth rate from the sixth pregnancy upward, would seem to suggest that four or five, at the most, is the maximum number of children the average woman should bear for optimum health results. Obviously primipara and multipara from the fifth pregnancy onward are the mothers in need of particular attention.

Duration of pregnancy, births and infant mortality

Assuming nine months to be the "normal" duration of pregnancy, just over 6% of Indian births in 1962 were "premature", a "prematurity rate" of 61 per 1000 live births. The real significance of below "normal" duration of pregnancy is most clearly illustrated by the mortality amongst these children. For children with less than 7 months pregnancy, the stillbirth rate was 73 and the infant mortality 947 per 1000 births, indeed only 2 of the 41 children so born survived twelve months. The situation

among children born after less than eight months pregnancy improved but can hardly be considered good, the infant mortality rate was 403 per 1000 live births but, at least, just over half did survive. The stillbirth rate in this group was 89 per 1000 births. For children with eight but not nine months duration of pregnancy, the stillbirth rate was 45 and the infant mortality 151 per 1000 live births. Thereafter there was a dramatic change. For children with nine months duration of pregnancy, the stillbirth rate dropped to 5 and the infant mortality to 67. On the other hand, amongst children with prolonged gestation beyond ten months, the stillbirth rate jumped up to 9. This group contributed no less than 77% of all stillbirths. Presumably the size of the child complicated the labour. Once born, however, these children enjoyed the "low" mortality rate of 48 per 1000 born, only 5 deaths in 106 births. Grossing them together, children born with less than a full nine months gestation period, comprising 6% of births, contributed 44% of stillbirths and 22% of all deaths in infancy, 1 in 5. The average infant mortality rate amongst them was 301 per 1000 born alive or close to one third of them, while the stillbirth rate was 58 as compared with 8 for all births. Of the 342 children born with under nine months gestation, only 225 survived to reach their first birthday, 65%. Of the 5256 children born after nine or more months gestation, 4883 survived their first year, 93%. There is justification for regarding all children with less than 9 months gestation as "premature".

Birth weight and infant mortality

As the weight of a child at birth is largely a function of the period of gestation, a reasonably close association between this analysis and the immediately preceding might be anticipated. There are, in fact, some interesting deviations. Had the analysis been made by half pounds of body weight rather than pounds and "prematurity" been measured as "under 5½ lbs", the prematurity rate would have been 8%, not 6% as suggested by duration of pregnancy. It was seen that the mortality rate amongst children born before term, even up to 8 months, justified regarding them all as "premature". The mortality rates in this analysis would seem to justify regarding all children weighing less than 6 lbs at birth as "premature" in which case the Indian prematurity rate was over 10% of births, almost 11%. (For each pound below 7 lbs weight, the mortality rate virtually doubled). Taking 6 lbs as the standard, out of the 606 babies born under that weight only 441 survived for twelve months, 72%. The total mortality among them, including stillbirths, was 272 per 1000 births. Among children of 6 lbs or more body weight at birth, 4667 out of 4992 survived to their first birthday, 93% and total mortality amongst them was 65 per 1000 births, less than a quarter of the mortality experienced amongst children of less than 6 lbs weight at birth. It is interesting that, as shown in the preceding analysis, 93% of children who went to full term also survived to their first birthday. If, however, the line of "maturity" is drawn at 5 lbs, an even more dramatic contrast is demonstrated. Of the 253 children weighing less than 5 lbs at birth, 106 died, either at birth or during the year, for a total mortality rate of 419 per 1000 births and only 147 or 58% survived the year, i.e. mortality among these children was six times the mortality among children weighing 6 lbs or more at birth. Among children weighing 7 lbs or more at birth, a good index to the fate of "normal" Indian infants, total mortality was 58 per 1000 births and 94% survived. The optimum birth weight was between 7-8 lbs. Among these children infant mortality was 44 per 1000 live births. Although infant mortality was lower amongst slightly heavier babies, the stillbirth rate rose. It must be noted that both these rates are still significantly above the national infant mortality rate for all infant deaths, including the premature excluded in the Indian rate. Mortality among Indian infants, even excluding the effect of prematurity and considering only the optimum, is excessive, indicative of defective home care, cultural or other environmental factors peculiar to Indians.

At the other end of the scale, a surprisingly large number of Indian babies weighed over 9 lbs at birth, 681 or 12% of all births. Only 106 or 2% were said to have gone over term. 3% of Indian babies weighed over 10 lbs at birth. Indian babies are popularly believed to be, on average, rather smaller than other babies. Assuming weights of 7-8 lbs to be "normal" and anything more or less, "abnormal", 34% of Indian babies were "normal", 30% "underweight" and 36% "overweight". This would hardly seem to support the popular impression but 94% of pregnancies went to full term or longer and only 70% of babies were of "normal" or greater weight at birth. This would seem to suggest that some 24% of Indian children born at full term were underweight, almost one quarter. There is therefore some justification for the impression that Indian babies tend to be tiny. Small size could be a racial characteristic. Against this hypothesis, however, must be considered the 36% of Indian children who were "overweight" when born, the 12% who weighed over 9 lbs. A more probable explanation would be defective nutrition during pregnancy in an appreciable number of cases.

To sum up, both the preceding analysis and this analysis suggests that between 6 to 10% of Indian births are "premature" and that 30% of all Indian babies are so seriously underweight at birth as to gravely affect their chances of survival through infancy. This is a serious situation pointing out the urgent necessity for getting all pregnant women under pre-natal supervision as early as possible and paying particular attention to their diet. These factors, together, however, do not account for all of the excessive infant mortality for, even when their influence is excluded, infant mortality remains high.

Manner of delivery, births and infant mortality

In 347 births or 6% of the total, no information was available on where the birth had occurred or by whom the mother had been delivered. In 24 of these cases it was known the birth had not taken place in any normal place, i. e. on the trail, in transit or in the bush. No stillbirths were reported in this group but four children so born failed to survive the first year, a mortality rate of 167 per 1000 live births. Infant mortality generally amongst all children born under obscure conditions was high, being at the rate of 87 per 1000 live births while the stillbirth rate, as reported, was 11 per 1000 births. It is unlikely that births actually supervised by a physician, nurse or even, in most instances, by a native midwife, would go unrecorded as such. It must therefore be supposed that the majority of these "unknown" births, if not all, were not attended by any professional attendant and probably occurred in the mother's home. Actually 649 births were known to have taken place in the mother's home and if, as seems justifiable, the other 347 "unknown" cases are added, the total of home deliveries was probably 996 or nearly 18% of all Indian births. This is a higher percentage than expected. It had previously been estimated that from 90-95% of Indian births occurred in hospitals or nursing stations. The data does not support this impression. Actually only 73% of births were delivered in hospital and only 9% in nursing stations, a total of 82%. Some home deliveries were supervised by physicians or nurses, actually 90 of the 996 or 9%, just under 2% of all births. Physicians delivered just under 70% of all births and nurses about another 14% so that some 84% approximately of Indian births were adequately supervised. The majority of home deliveries were handled by native midwives, untrained in the usual meaning of the term but experienced. These midwives delivered at least 10% of all births and it is noteworthy that this 10% contributed 7% of the stillbirths as reported and 22% of the infant mortality, the infant mortality rate in this group of children being 177 per 1000 live births. Regarding stillbirths, it is interesting to note that the hospitals reported 76% of all stillbirths in the 73% of births delivered in hospital, for a stillbirth rate of 9 per 1000 births and physicians delivered 78%. Although complicated cases would naturally tend to concentrate in the hospitals it is unlikely that such a high percentage

of stillbirths would and that the explanation probably lies in more accurate reporting, especially as the rate is quite moderate in comparison with the national rate of 12. It is most improbable that the stillbirth rate amongst children born elsewhere than in hospital could have been as low as the data suggest. Perhaps the most dramatic contrasts can be drawn between professionally supervised births and unprofessionally supervised and between births in institutions and home deliveries. Among the 4682 children delivered by physicians and nurses 354 died, either at birth or during the year, giving a mortality rate, including stillbirths, of 76 per 1000 births. Amongst the 916 children not delivered by a physician or a nurse, 136 died, giving a mortality rate of 148 per 1000 births. Of the 4602 children born in hospitals and nursing stations, 4263 survived the first year or almost 93%. Of the 966 children not born in a hospital or nursing station, 845 survived the first year, less than 85%. Amongst children born in institutions under proper care the total mortality rate was 74 per 1000 births (339 deaths) but, amongst children not born in a hospital or nursing station, 151 deaths gave a rate of 152 per 1000 births, more than twice as great. Whatever can be said for home deliveries elsewhere, clearly it cannot be advocated for Canadian Indians under present conditions. It is significant that the 12% of births classified as delivered at home contributed one quarter of the total infant mortality during the year while the 73% of births delivered in hospital contributed only 59%.

Complications of pregnancy and delivery and infant mortality

In 90% of all births nothing was recorded regarding complications. Unfortunately this is not quite synonymous with saying 90% of births were uncomplicated. In some instances it merely reflects the inability of the nurse to get information on complications. However, as has been shown, as 82% of the births were supervised by competent personnel, it is reasonable to suppose the majority, at least, of complications were reported. At the same time it is interesting to note that this 90% of "uncomplicated" births provided 72% of the stillbirths. The complication having the most serious effects was placenta praevia. This one complication which affected less than 1% of all births, was associated with a high stillbirth rate and also a very high infant mortality rate. It would appear that placenta praevia was not only a hazard to the child at birth but significantly lessened his chances of surviving infancy. Disproportion and malposition had much the same effect on infant mortality but was not associated, in this study, with stillbirths to the same extent. Much the commonest injury suffered was laceration of the perineum which occurred in 3% of all births. However deleterious to the mother these injuries may have been, they had no adverse effect on the children. Traumata suffered by the child at birth, only 8 cases reported, were, however associated with a stillbirth and one infant death, giving high rates respectively but of doubtful statistical significance. "Other complications", unfortunately not always specified, were also associated with high stillbirths and infant mortality rates and were reported in 2% of all births. In view of the serious risk to the child, the need to diagnose placenta praevia, malposition and disproportion early so that suitable arrangements can be made is stressed.

Nutrition during pregnancy, births and infant mortality

In nearly one third of all births nothing was reported regarding the mother's nutritional state during her pregnancy. The data are examined both including and excluding these "unknown" cases. Both tables show the same general pattern. Considering the "known cases" only, 78% of the births were to mothers whose diet was considered to have been "adequate" by accepted Canadian dietetic standards, 22% to mothers who subsisted during pregnancy on diets regarded as "inadequate" mainly in protein content but also in total caloric value. The 78% of births to

mothers whose nutrition was satisfactory contributed 57% of stillbirths and 68% of the infant mortality but the 22% of births to undernourished mothers contributed 43% of the stillbirths and 32% of the infant mortality. The stillbirth rate among children of undernourished mothers was 2.5 times the rate among children born to well nourished mothers and the infant mortality rate was 1.6 times the infant mortality rate amongst the infants of well nourished mothers (107:67). These are significant differences. Undernutrition of the mother increased the risk of stillbirths and reduced a child's chances of surviving the first year. Considering the births as a whole, it is gratifying that at least 53% of mothers were well nourished but at least 15% were not and this 15% of poorly nourished mothers contributed 28% of all stillbirths and 20% of the total infant mortality. The proportion of undernourished mothers was probably much higher than 15% but, as over half were well nourished, even if all the "unknown" cases were undernourished, which is unlikely, could not have exceeded 47%. Undernutrition, however, clearly is a factor in maintaining the high loss of infant life, indicating the necessity for proper pre-natal care during pregnancy including supervision of the diet. Fortunately it affects rather a smaller proportion of Indian women than might have been supposed but still remains an important factor, influencing infant mortality quite out of proportion to the actual number of mothers involved.

Pre-natal supervision, births and infant mortality

In over one third of reports on women reported to have been pregnant in 1962 there was nothing reported in respect to pre-natal supervision. It is unlikely that many, if any, of this group got any supervision during their pregnancy. This proportion of pregnant women can therefore be taken as an index of the degree of failure of the Medical Services to cover all pregnant Indian women. One third is a substantial proportion. In another 11% the nurses reported they were uncertain whether or not the women had received any care and, if they had, they did not know over how long a period. It could not have been either extensive or regular. It would therefore appear extremely doubtful if from 40 to 45% or more of the Indian women pregnant in 1962 got any really adequate pre-natal care.

Some 59% were reported to have attended pre-natal clinics at some time during their pregnancy, 53% got services from physicians and 54% from nurses. That those who got adequate care benefitted, is very clearly shown in the mortality rates. The overall infant mortality rate for all infants born in 1962 was 80 per 1000 live births but amongst the children of mothers getting pre-natal care from physicians for six months or more of their pregnancy the infant mortality rate was 46 per 1000 live births. Amongst the group supervised by nurses for that period it was 60 per 1000 live births. Amongst the children of the group who attended pre-natal clinics regularly during this period the infant mortality rate was 54 per 1000 live births. Presumably the nurses included some women who did not attend the clinics but were seen at home. In all cases the reduction is significant, the Chi squared test indicating that the difference was quite unlikely to be a matter of chance. The difference between infant mortality in these groups and the infant mortality amongst the children of mothers who were unlikely to have had much if any pre-natal care is much more significant. Amongst the children of mothers who were not known to have attended pre-natal clinics, the infant mortality rate was 102 per 1000 live births. Much the same picture is presented by the respective group specific stillbirth rates but the differences are not so marked.

One feature that emerges, however, is that women who attended irregularly or only late in pregnancy did not benefit to anything like the same extent. Amongst the children of women coming under care in the third trimester only, infant mortality ranged from 71 to 78 per 1000 live

births, not significantly less than the overall rate. The rates were significantly high amongst women who did not receive care in the third trimester. This will be examined in greater detail in a subsequent section of this report dealing specifically with the utilisation of pre-natal services. Only some 30% of pregnant women made really adequate use of the pre-natal services and almost as many made only sporadic or late use of them. Amongst the women who came under pre-natal care, the greatest number did not come under supervision until the third trimester and reaped comparatively little benefit, if the mortality amongst their children is any index. This late appearance is probably associated with cultural patterns but, unless educational activities can increase earlier acceptance of pre-natal services, there would appear to be little hope of improving the infant mortality rates under current pre-natal practice. The services were effective but they effectively reached less than one third of pregnant women and completely failed to touch more than one third. Among the remaining third, receiving late or irregular care, they were relatively ineffective. Although somewhat disappointing and discouraging, this picture also indicates how matters can be improved and along what lines efforts should be increased and also that, when properly used, pre-natal services were markedly effective even if they still failed to reduce Indian infant mortality rates to the Canadian national level. Indian women must be brought under pre-natal care earlier and in greater numbers.

Supplementing the diet, births and infant mortality

The normal diet was reported to have been supplemented in 83% of cases. In 17% there was no report. There is a significant difference in the infant mortality rates experienced in these two groups, the Chi squared test index being 53.78 (significant if over 3.89). However 189 of those women took only the pre-natal capsules and the infant mortality experienced amongst this group was significantly high. Pre-natal capsules alone do not appear to offset the ill effects of general undernourishment, particularly if taken, as the majority did, only during the middle period of pregnancy. It would be interesting to know why the capsules were discontinued later. Although those 29 women who took capsules throughout appear to have benefitted to some extent it was not to any significant degree, the Chi squared test showing an index of 0.9, which means the somewhat lower rate might have been a matter of mere chance and not necessarily the result of taking the capsules for the longer period. Again, although the group taking capsules and other supplements appear to have had a slightly reduced infant mortality as compared with those having supplementary feeding only, the difference is not significant so that there is no evidence that the addition of the capsules effected any real benefit. The difference is due to other supplements. This is disconcerting as great things were expected as a result of introducing the I. N. H. S. pre-natal capsules but, measured by their influence on the health of the children born to mothers taking them, there has been no detectable benefit, in fact the evidence might be taken to indicate they had a positively deleterious effect on the children as mortality amongst the children of mothers taking the capsules only is quite significantly higher than amongst the children of mothers not taking anything. A more correct understanding is probably that they failed to affect to any degree what was going to happen anyway as a result of other factors. Obviously no reliance can be placed on these capsules. This is discussed further in a later section dealing with maternal haemoglobin levels. It is interesting that 80% of mothers supplemented their diets but only 59% attended pre-natal classes. Some 20% appear to have learned the lesson adequately in some way at some time.

Dental care

Attention to the mother's teeth can not be expected to have much effect on the infant mortality rate and there was no significant difference in the mortality experienced amongst children of mothers receiving dental

attention and those who presumably did not. It is startling to note, however, that virtually all stillbirths occurred in the "untreated" group. No direct cause and effect relationship is inferred except that most probably all mothers receiving dental attention were under better general supervision or were a more responsible conscientious group of women. The most significant feature of this table is that only 7% of mothers did receive dental attention. The majority of those saw the dentist in the second and third trimesters only. In the interests of the mothers if not their offspring, it would be advisable to increase this service to pregnant women. Dental diseases are notoriously prevalent amongst Indians generally and the adverse effect on such diseases of associated pregnancy has long been recognised. Dental services to pregnant women are obviously deficient.

Post-natal supervision and infant mortality

There was a very significant reduction in the infant mortality rate among children kept under nursing post-natal supervision. Among the group known not to have been supervised at all, the infant mortality rate was 136 per 1000 live births but among the group known to have been under supervision for some period the rate was 45 per 1000 live births. This group comprised 65% of all live births. The other 35% were either known not to have been supervised or reported as not known to have been under nursing care at any time, but in many cases the question was simply left unanswered. Amongst the group as a whole the infant mortality rate was 144 per 1000 live births which does not suggest many of them could have had much, if any, nursing supervision. The duration of post-natal nursing supervision was important. There was a very decided difference in mortality between those children getting only five or less months supervision and those getting six or more months care, in fact, those getting less than five months were little better off than those getting none at all. Amongst those getting only one month's care, which obviously would have included a high proportion of the weak and sickly infants, infant mortality was actually at its peak, 199 per 1000 live births. The mortality rate did not decline significantly until after five months. At that point, however, the drop was so dramatic that in spite of the high mortality in the first five months, the 65% of children who did get attention produced only 37% of all infant deaths while the 35% who got no attention contributed 63% of the infant deaths. The most gratifying feature of this study is the finding that 1209 children (22%) of the total were kept under supervision for the whole year and amongst them only four died, an infant mortality rate of only 3 per 1000 live births, gratifying, that is, until it is realised this also means 78% were not kept under nursing supervision for the whole year. This 78%, of course, would include those who died in spite of supervision, 163 or 3% of all births, but three quarters of the children born did not get adequate nursing care during the first year of their life.

As regards post-natal services by physicians, the effect on infant mortality was not so pronounced, presumably because there would be a tendency to refer to physicians only children who were ailing. However, the same pattern is discernible. There was a significant drop in mortality amongst children receiving attention from physicians for six months and longer. Only 8% of infants received attention from physicians for the full twelve months but there was no mortality among the group of 459 children. The overall mortality rate among children attended by a physician at some time (only 28% of all children born alive) was 42 which compares favourably with the nurses' rate of 45. It is evident that post-natal services are effective in reducing infant mortality but also that there is great room for improving the scope of post-natal care both by nurses and physicians.

Effect of instructing mothers in child care

Some instruction in child care was given to 4045 mothers or 73% of the total by nurses at some time, 407 were known not to have been given any

instruction at any time (7%) and it was doubtful if 1100 or 20% got any. The differences in the infant mortality rates experienced in these three groups is highly significant. Amongst instructed mothers it was 56, amongst the definitely uninstructed it was 138 and amongst those who probably got little or no instruction it was 147. This is most unlikely to be a matter of mere chance, the Chi squared test giving an index of 145 for the 4050 mothers instructed as against the 1507 almost certainly uninstructed, in terms of the relative mortality. It would seem therefore that even a limited and irregular degree of instruction was highly effective in reducing infant mortality. However, the negative side is that only 73% of mothers were covered, leaving 27% to their own devices and with obviously serious consequences to their children. This group of Indian mothers, slightly more than a quarter of all Indian mothers, who got little or no advice, almost doubled the infant mortality.

Effect of breast feeding

It was moderately gratifying that 69% of mothers breast fed their children for at least some time but disappointing that half of them abandoned breast feeding within the first few weeks. Children who were breast fed for extended periods obviously benefitted. There was a marked reduction in infant mortality amongst infants breast fed for an extended period and this reduction is directly related to the length of breast feeding. Infant mortality amongst children who were breast fed for less than two months was 80 but amongst those who were breast fed for seven months or more (only 17% of all born alive) it was only 16 per 1000 born alive. Breast feeding for six months was associated with a reduction of from 80 to 30. These are highly significant differences. It is not certain that the 31% of mothers classified as "unknown" in regard to the duration of breast feeding did not, in fact, breast feed their children for at least a short time but, judging by the infant mortality amongst their children, it would appear to be unlikely that many of them persevered for very long. These findings strongly support advocating a policy of encouraging Indian mothers to feed their children at the breast.

Supervision of bottle feeding and infant mortality

It is sometimes argued that properly supervised artificial feeding is as safe as breast feeding. The nurses reported supervising bottle feeding in 50% of all infants and not supervising 12%. Among the supervised the mortality rate was 45 per 1000 infants, among the group reported as not having been supervised, 51 per 1000. The difference is not statistically significant, the Chi squared test being 0.55. In other words, in this group, there is no statistical basis for believing supervision made any difference in the mortality. As was seen in the preceding analysis, the mortality rate amongst children breast fed for only five months was 43, so that, even at its best, supervision barely succeeded in equalling five months breast feeding and fell quite significantly short of the result of breast feeding for six months. However, the nurses failed to report whether or not they had supervised 1123 infants who must have been bottle fed. It is unlikely they would fail to report a case in which they had, in fact, supervised the feeding. It can thus be reasonably assumed that these 20% of the children also did not have the benefit of nursing supervision, raising the proportion of unsupervised bottle feedings to 32% of all births. It was seen in the preceding table that 18% of the children were breast fed for six months at least and among them mortality was at the rate of 17 per 1000. Mortality amongst the 1123 not reported and presumably unsupervised was 270 or a rate of 240 per 1000. Among the total group of babies who were reported as "not supervised" or not reported as supervised and who must have been bottle fed because they were not breast fed, mortality was 170 per 1000. The rate of 45 per 1000 got among the supervised group in this context does then show a most significant reduction in mortality. However, mortality amongst bottle fed babies as a whole, including the

supervised group, was still 94 per 1000. In the Indian situation, bottle feeding is a hazard to infant life and, though careful supervision was effective to quite a marked degree in countering the danger, it was much less effective than simple breast feeding for six months. These two studies indicate clear guide lines for policy planning.

Influence of nature of feeding after weaning

Quite a distressing number of children did not survive long enough to be weaned as only 3885 reports of weaning practices were received. Provided they got enough to eat, even if the quality was judged by the nurse to be inferior, children survived much better than those who got insufficient food, even if regarded as of good quality. Mortality amongst children given enough food, in the nurse's estimation, was 23 per 1000 and did not differ with the quality of the food. These criteria were not objectively defined and must be regarded as somewhat doubtful classifications, very liable to the subjective evaluation of the individual nurse reporting. Among children who did not get enough to eat, in the nurse's opinion, mortality was 49 per 1000. Among children weaned on diets which the reporting nurse did not feel capable of judging quantitatively but did qualitatively, those who got "good quality" food had a mortality of 34 but those who got "poor quality" food suffered a mortality of 91 per 1000. There was a fourth group which the nurse felt unable to evaluate either quantitatively or qualitatively which had a mortality rate of 78 per 1000. It is noteworthy that only 70% of those children were considered to be getting good and adequate diets, 22% as getting insufficient to eat. When insufficiency coincided with poor quality, mortality jumped to 64 per 1000. Good quality feeding, even in amounts held to be inadequate, was, however associated with a much lower mortality. If instead of examining quantity by quality, quality is examined by quantity, it is found that children who got good quality food, regardless of the amount, had a 22 per 1000 mortality rate while children on poor quality food, including those getting plenty of it, had a mortality rate of 57 per 1000. Some 78% of these Indian children were judged to have been weaned onto good quality diets but over 20% were held to be on inferior quality food and, as stated above, a good 22% were not getting enough of whatever quality of food they were getting.

Influence of supplementing infants' diet with vitamins

Vitamin supplements were added to the infants' food in 68% of children. Among this group the overall mortality rate was 43 per 1000 as compared with 158 amongst those not reported to have been given vitamins, a statistically significant reduction. However, mortality amongst those who got vitamins for only 1 to 3 months was also 151 per 1000. No significant modification was apparent under less than six months administration.

Influence of supplementing infants' diet with I. N. H. S. paediatric iron drops

Iron drops were less popular than vitamin supplements. Only 42% of children were given these. Among the treated group the mortality rate was 37 per 1000 as against 111 per 1000 among the untreated group, a statistically significant reduction. Even short duration administration appeared to be effective, mortality among those getting the drops for only a few weeks being only 59 per 1000. This stands in marked contrast to the apparent ineffectiveness of supplementing with vitamins for less than six months.

Influence of quality of home care

The quality of home care was evaluated on 75% of infants and not reported in 25%. Mortality among children receiving what was considered "adequate" home care was only 32 per 1000 as against 92 per 1000 amongst

Maternal and Child Health Survey - 1962
Births and Mortality by Calendar Month of Birth

Calendar Month of birth	Actual Numbers				Percentage Distribution			Mortality Rates		
	Total births	Born alive	Still born	Died in first year	Total births	Born alive	Still born	Died in first year	Still births	Infant mortality
Jan.....	506	504	2	42	9	9	4	10	4	85
Feb.....	474	468	6	43	8	8	13	10	13	92
March.....	520	520	0	48	9	9	0	11	0	92
1st Quarter	1,500	1,492	8	134	27	27	17	30	5	90
Apr.....	482	476	6	34	9	9	13	8	12	71
May.....	490	485	5	34	9	9	11	8	10	70
Jun.....	509	507	2	38	9	9	4	9	4	75
2nd Quarter.....	1,481	1,468	13	106	26	26	28	24	9	72
Jul.....	470	467	3	43	8	8	7	10	6	92
Aug.....	485	482	3	33	9	9	7	7	6	68
Sept.....	416	415	1	36	7	7	2	8	2	87
3rd Quarter.....	1,371	1,364	7	112	24	25	15	25	5	82
Oct.....	427	419	8	31	8	8	17	7	19	74
Nov.....	393	389	4	37	7	7	9	8	10	95
Dec.....	381	376	5	23	7	7	11	5	13	61
4th Quarter	1,201	1,184	17	91	21	21	37	20	14	77
Not known.....	45	44	1	1	1	1	2	0	22	23
Total.....	5,598	5,552	46	444	100	100	100	100	8	80

Maternal and Child Health Survey 1962
Births and Mortality by Age of Mother Numbers

Age of Mother	Total Births	Born alive			Still born	Died in first year		
		Males	Females	Total		Males	Females	Total
-15	16	10	6	16	0	0	0	0
15	26	12	14	26	0	1	1	2
16	73	44	29	73	0	7	2	9
17	152	76	75	151	1	8	8	16
18	196	101	94	195	1	6	9	15
19	282	155	124	279	3	15	10	25
15-19	729	388	336	724	5	37	30	67
20	313	161	151	312	1	16	7	23
21	308	161	145	306	2	18	16	34
22	334	170	162	332	2	15	16	31
23	330	163	167	330	0	7	16	23
24	313	166	143	309	4	8	13	21
20-24	1,598	821	768	1,589	9	64	68	132
25	304	155	148	303	1	8	6	14
26	275	156	117	273	2	11	8	19
27	265	132	133	265	0	4	8	12
28	267	130	137	267	0	13	12	25
29	236	116	119	235	1	14	7	21
25-29	1,347	689	654	1,343	4	50	41	91
30	234	130	99	229	5	8	7	15
31	207	98	104	202	5	11	3	14
32	186	89	95	184	2	11	8	19
33	152	90	62	152	0	9	3	12
34	173	83	85	168	5	9	3	12
30-34	952	490	445	935	17	48	24	72
35	157	81	75	156	1	7	6	13
36	134	71	60	131	3	6	5	11
37	120	61	59	120	0	5	5	10
38	128	63	63	126	2	5	3	8
39	105	52	53	105	0	8	4	12
35-39	644	328	310	638	6	31	23	54
40	71	36	35	71	0	8	1	9
41	65	31	34	65	0	4	3	7
42	62	33	27	60	2	2	0	2
43	30	16	14	30	0	1	1	2
44	16	3	13	16	0	0	2	2
40-44	244	119	123	242	2	15	7	22
45	47	21	24	45	2	3	2	5
Unknown	21	9	11	20	1	1	0	1
All ages	5,598	2,875	2,677	5,552	46	249	195	444

Table 8

Maternal and Child Health Survey 1962
Births and Mortality by Age of Mother
Percentage Distribution, Sex Ratio at Birth and Mortality Rates

Age of Mother	Percentage Distribution			M:F Sex Ratio per 1000 (live births)	Mortality Rates			
	Total births	Still births	Died in first year		Stillbirths per 1000 total births	I.M.R. per 1000 live births		
						Male	Female	Total
-15	0	0	0	1,667	0	0	0	0
15	0	0	1	857	0	83	71	77
16	1	0	2	1,517	0	159	69	123
17	3	2	4	1,013	7	105	107	106
18	4	2	3	1,074	5	59	96	77
19	5	7	6	1,250	11	97	81	90
15-19	13	11	15	1,155	7	95	89	93
20	6	2	5	1,066	3	99	46	74
21	5	4	8	1,110	6	112	110	111
22	6	4	7	1,049	6	88	99	93
23	6	0	5	976	0	43	96	70
24	6	9	5	1,161	13	48	91	68
20-24	29	20	30	1,069	6	78	89	83
25	5	2	3	1,047	3	52	41	46
26	5	4	4	1,333	7	71	68	70
27	5	0	3	992	0	30	60	45
28	5	0	6	949	0	100	88	94
29	4	2	5	975	4	121	59	89
25-29	24	9	20	1,054	3	73	63	68
30	4	11	3	1,313	21	62	71	66
31	4	11	3	942	24	112	29	69
32	3	4	4	937	11	124	84	103
33	3	0	3	1,452	0	100	48	79
34	3	11	3	976	29	108	35	71
30-34	17	37	16	1,101	18	98	54	77
35	3	2	3	1,080	6	86	80	83
36	2	7	2	1,183	22	85	83	84
37	2	0	2	1,034	0	82	85	83
38	2	4	2	1,000	16	79	48	63
39	2	0	3	981	0	154	75	114
35-39	12	13	12	1,058	9	95	74	85
40	1	0	2	1,029	0	222	29	127
41	1	0	2	912	0	129	88	108
42	1	4	0	1,222	32	60	0	33
43	1	0	0	1,143	0	63	71	67
44	0	0	0	231	0	0	154	125
40-44	4	4	5	967	8	126	57	91
45+	1	4	1	875	43	143	83	111
Unknown	0	2	0	818	48	111	0	50
All ages	100	100	100	1,074	8	87	73	80

Table 9

Maternal and Child Health Survey 1962
Births and Mortality by Marriage Status of Mother
Numbers

Marriage Status	Total births	Born alive			Still-born	Died in first year		
		Male	Female	Total		Male	Female	Total
Single.....	1,247	656	582	1,238	9	66	45	111
Married.....	4,128	2,121	1,976	4,097	31	173	145	318
Widowed.....	51	26	23	49	2	1	0	1
Divorced.....	3	1	2	3	0	0	0	0
Separated.....	45	16	28	44	1	1	2	3
Common Law.....	110	50	57	107	3	7	2	9
Unknown.....	14	5	9	14	0	1	1	2
Total.....	5,598	2,875	2,677	5,552	46	244	195	444

Percentage Distribution and Mortality Rates

Marriage Status	M:F Sex Ratio (live births)	Percentage Distribution			Mortality Rates			
		Total births	Still-births	Died in first year	Stillbirths per 1000 total births	I.M.R. per 1000 live births		
						Male	Female	Total
Single.....	1,127	22	20	25	7	100	77	90
Married.....	1,073	74	67	72	8	82	73	78
Widowed.....	1,130	1	4	0	39	38	0	20
Divorced.....	500	0	0	0	0	0	0	0
Separated.....	571	1	2	1	22	63	71	68
Common Law.....	877	2	7	2	27	140	35	84
Unknown.....	556	0	0	0	0	200	111	143
Total	1,074	100	100	100	8	87	73	80

Maternal and Child Health Survey 1962
Births and Mortality by Birth Rank of Child
Numbers

Birth Rank	Total Births	Born Alive			Still born	Died in First Year		
		Male	Female	Total		Male	Female	Total
1st child.....	807	427	374	801	6	35	33	68
2nd ".....	759	425	332	757	2	39	28	67
3rd ".....	635	336	296	632	3	29	23	52
4th ".....	649	342	305	647	2	22	16	38
5th ".....	588	281	304	585	3	26	25	51
6th ".....	462	215	242	457	5	22	21	43
7th ".....	408	207	195	402	6	17	14	31
8th ".....	335	163	167	330	5	12	6	18
9th ".....	955	479	462	941	14	47	29	76
or more.....								
Grand Total	5,598	2,875	2,677	5,552	46	249	195	444

Percentage Distribution and Mortality Rates

Birth Rank	Percentage Distribution				Mortality Rates			
	M:F Sex Ratio (live births)	Total Births	Still Births	Died in first year	Stillbirths per 1000 total births	I.M.R. per 1000 live births		
						Male	Female	Total
1st child.....	1,142	14	13	15	7	82	88	85
2nd ".....	1,280	14	4	15	3	92	84	89
3rd ".....	1,135	11	7	12	5	86	78	82
4th ".....	1,121	12	4	9	3	64	52	58
5th ".....	924	11	7	11	5	93	82	87
6th ".....	888	8	11	10	11	102	87	94
7th ".....	1,062	7	13	7	15	82	72	77
8th ".....	976	6	11	4	15	74	36	55
9th ".....	1,037	17	30	17	15	98	63	81
or more.....								
Grand Total	1,074	100	100	100	8	87	73	80

Maternal and Child Health Survey 1962
Births and Mortality by Duration of Pregnancy
Numbers

Duration of Pregnancy	Total births	Born alive			Still born	Died in first year		Total
		Male	Female	Total		Male	Female	
Under 7 mths	41	20	18	38	3	19	17	36
7 but under 8 mths	79	42	30	72	7	19	10	29
8 " " 9 "	222	105	107	212	10	15	17	32
9 " " 10 "	5,150	2,648	2,477	5,125	25	191	151	342
over 10 mths	106	60	45	105	1	5	0	5
Grand Total	5,598	2,875	2,677	5,552	46	249	195	444

Percentage Distribution and Mortality Rates

Duration of Pregnancy	M : F Sex Ratio (live births)	Percentage Distribution			Mortality Rates			
		Total births	Still births	Died in first year	Stillbirths per 1000 total births	I.M.R. per 1000 live births		
						Male	Female	
under 7 mths	1,111	1	7	8	73	950	944	947
7 but under 8 mths	1,400	1	15	7	89	452	333	403
8 " " 9 "	981	4	22	7	45	143	159	151
9 " " 10 "	1,069	92	54	77	5	72	61	67
over 10 mths.....	1,333	2	2	1	9	83	0	48
Grand Total	1,074	100	100	100	8	87	73	80

Maternal and Child Health Survey 1962
Births and Mortality by Birth Weight of Child

Birth Weight	Total births	Number born alive			Mortality			
		Males	Females	Total	Still born	Died in first year		
						Males	Females	Total
Under 3 lbs.	40	18	19	37	3	15	19	34
3 lbs. but under 4 lbs.	61	31	28	59	2	19	10	29
4 lbs. but under 5 lbs.	152	76	68	147	5	20	13	33
5 lbs. but under 6 lbs.	353	163	189	352	1	35	23	58
Subtotal weighing less than 6 lbs.	1,606	291	304	595	11	89	65	154
6 lbs. but under 7 lbs.	1,102	554	541	1,095	7	48	44	92
7 lbs. but under 8 lbs.	1,882	940	928	1,868	14	65	52	117
8 lbs. but under 9 lbs.	1,327	705	617	1,322	5	32	26	58
Subtotal weighing 6 lbs. under 9 lbs.	4,311	2,199	2,086	4,285	26	145	122	267
9 lbs. but under 10 lbs.	513	293	214	507	6	11	4	15
10 lbs. or more	168	92	73	165	3	4	4	8
Subtotal weighing 9 lbs. or more at birth	681	385	287	672	9	15	8	23
	5,598	2,875	2,677	5,552	46	249	195	444

Birth Weight	Sex Ratio: Percentage Distributions and Mortality Rates					Mortality Rate		
	Males Sex Ratio (live births)	Percentage Distribution			Still births	I.M.R. per 1000 live births		Total
		Total births	Still births	Died in first year		Male	Female	
Under 3 lbs.	947	1	7	8	75	833	1,000	919
3 lbs. but under 4 lbs.	1,107	1	4	7	33	613	357	492
4 lbs. but under 5 lbs.	1,162	3	11	7	33	253	191	224
5 lbs. but under 6 lbs.	862	6	2	13	28	215	122	165
Subtotal weighing less than 6 lbs.	957	11	24	35	18	306	214	259
6 lbs. but under 7 lbs.	1,024	20	15	21	6	87	81	84
7 lbs. but under 8 lbs.	1,013	34	30	26	7	69	56	63
8 lbs. but under 9 lbs.	1,143	24	11	13	4	45	42	44
Subtotal weighing 6 lbs. under 9 lbs.	1,054	77	56	60	6	66	58	62
9 lbs. but under 10 lbs.	1,369	9	13	3	12	38	19	30
10 lbs. or more.	1,826	3	7	2	18	43	55	48
Subtotal weighing 9 lbs. or more.	1,341	12	20	5	13	39	28	34
Grand Total	1,074	100	100	100	8	87	73	80

Table 13

Maternal and Child Health Survey 1962
Births and Mortality by Attendant at Delivery and Place

Attendant at Delivery	Place of Birth	Numbers				Percentage distribution			Mortality Rates	
		Total Births	Born Alive	Still born	Died in first year	Total Births	Still births	Died in first year	Stillbirths per 1000 births	I.M.R. per 1000 live births
Physician	In hospital.....	3,895	3,860	35	248	70	76	56	9	64
	Nursing station..	4	4	0	1	0	0	0	0	250
	At home	13	12	1	1	0	2	0	77	83
	Total.....	3,912	3,876	36	250	70	78	56	9	64
Nurse	In hospital.....	200	200	0	12	4	0	3	0	60
	Nursing station..	493	491	2	41	9	4	9	4	84
	At home	77	76	1	12	1	2	3	13	158
	Total.....	770	767	3	65	14	7	15	4	85
Native Midwife	At home	554	541	3	96	10	7	22	6	177
Relative	At home	13	13	0	2	0	0	0	0	154
Unstated	In hospital.....	6	6	0	0	0	0	0	0	0
	Nursing station..	4	4	0	0	0	0	0	0	0
	At home	2	2	0	0	0	0	0	0	0
	"elsewhere".....	24	24	0	4	0	0	1	0	167
	unreported	323	319	4	27	6	9	6	12	85
	Total.....	359	355	4	31	6	9	7	11	87
All Attendants		5,598	5,552	46	444	100	100	100	8	80

Maternal and Child Health Survey 1962
Births and Mortality by Place of Delivery and Attendant

Place of Delivery	Attendant	Numbers				Percentage Distribution			Mortality Rates	
		Total Births	Born Alive	Still born	Died in first year	Total Births	Still Births	Died in first year	Stillbirths per 1000 births	I.M.R. per 1000 live births
Hospital	Physician.....	3,895	3,860	35	248	70	76	56	9	64
	Nurse	200	200	0	12	4	0	3	0	60
	not stated.....	6	6	0	0	0	0	0	0	0
	all hospital deliveries.....	4,101	4,066	35	260	73	76	59	9	64
Nursing Station	Physician.....	4	4	0	1	0	0	0	0	250
	Nurse	493	491	2	41	9	4	9	4	84
	not stated.....	4	4	0	0	0	0	0	0	0
	all nursing station deliveries.....	501	499	2	42	9	4	9	4	84
At Home	Physician.....	13	12	1	1	0	2	0	77	83
	Nurse	77	76	1	12	1	2	3	13	158
	Midwife.....	544	541	3	96	10	7	22	6	177
	Relative	13	13	0	2	0	0	0	0	154
	not stated.....	2	2	0	0	0	0	0	0	0
	all home deliveries.....	649	644	5	111	12	11	25	8	172
"Elsewhere" Unknown All locations	unknown.....	24	24	0	4	0	0	1	0	167
	unknown.....	323	319	4	27	6	9	6	12	85
	all attendants ...	5,598	5,552	46	444	100	100	100	8	80

Maternal and Child Health Survey 1962
Influence on Births and Mortality of Complications of Pregnancy and Delivery

Complications of pregnancy and delivery	Births		Mortality		Percentage Distribution			Mortality Rates	
	Total Births	Born Alive	Still born	Died in first year	Total Births	Still Births	Died in first year	Still births per 1000 births	Infant Mortality per 1000 live births
Placenta praevia.....	49	45	4	13	1	9	3	82	289
Retained placenta.....	41	41	0	3	1	0	1	0	73
Other haemorrhage.....	81	79	2	2	1	4	0	25	25
Abnormal pelvis.....	21	20	1	1	0	2	0	48	50
Disproportion or malposition.....	52	50	2	10	1	4	2	38	200
Prolonged labour.....	26	25	1	1	0	2	0	38	40
Perineal laceration.....	157	157	0	2	3	0	0	0	13
Other trauma.....	8	7	1	1	0	2	0	125	143
Other complications.....	103	101	2	12	2	4	3	19	119
None recorded.....	5,060	5,027	33	399	90	72	90	7	79
Total.....	5,598	5,552	46	444	100	100	100	8	80

Maternal and Child Health Survey 1962
Influence on Births and Mortality of Nutrition of Mother

Nutrition of Mother	Births		Mortality		Percentage Distribution			Mortality Rates	
	Total	Born alive	Still born	Died in first year	Total births	Still births	Died in first year	Stillbirths per 1000 live births	Infant Mortality per 1000 live births
Good.....	2,943	2,926	17	196	53	37	44	6	.67
Poor.....	823	810	13	84	15	28	19	16	104
Substandard.....	24	24	0	7	0	0	1	0	292
Unknown.....	123	122	1	16	2	2	4	8	131
Not reported.....	1,685	1,670	15	141	30	33	32	9	84
Totals.....	5,598	5,552	46	444	100	100	100	8	80

Known Cases Only

Table B

Nutrition good.....	2,943	2,926	17	196	78	57	68	6	67
Nutrition poor.....	847	834	13	91	22	43	32	15	107
Total.....	3,790	3,760	30	287	100	100	100	8	76

Chi squared test of significance of differences in infant mortality 16.33
(significant if greater than 3.89)

Maternal and Child Health Survey 1962
Influence on Mortality of Pre-natal Supervision by a Physician

Period of pre-natal supervision by a physician	Number of Births		Mortality		Percentage Distribution			Mortality Rates	
	All births	Born alive	Still births	Died in first year	All births	Still births	Died in first year	Still births per 1000 births	Infant Mortality per 1000 live births
All three trimesters.....	659	655	4	25	12	9	6	6	38
2nd and 3rd "	990	984	6	50	18	13	11	6	51
Subtotal well supervised	1,649	1,639	10	75	29	22	17	6	46
1st and 2nd trimesters only.....	25	24	1	6	0	2	1	40	250
1st " " 3rd "	57	54	3	1	1	7	0	53	19
3rd trimester only	1,088	1,083	5	77	19	11	17	5	71
2nd " "	108	106	2	7	2	4	2	19	66
1st " "	61	61	0	4	1	0	0	0	66
Subtotal partially supervised.....	1,339	1,328	11	95	24	24	21	8	72
Total supervised.....	2,988	2,967	21	170	53	46	38	7	57
If supervised, when unknown.....	584	577	7	61	10	15	14	12	106
Total reported	3,572	3,544	28	231	64	61	52	8	65
Not reported	2,026	2,008	18	213	36	39	48	9	106
Total probably not supervised.....	2,610	2,585	25	274	47	54	62	10	106
Grand Total.....	5,598	5,552	46	444	100	100	100	8	80

Maternal and Child Health Survey 1962
Influence on Mortality of Pre-natal Supervision by a Nurse

Period of pre-natal supervision by a nurse	Number of Births		Mortality		Percentage Distribution			Mortality Rates	
	All births	Born alive	Still born	Died in first year	All births	Still births	Died in first year	Still births per 1000 births	Infant mortality per 1000 live births
All three trimesters.....	613	611	2	41	11	4	9	3	67
2nd and 3rd "	1,154	1,146	8	65	21	17	15	7	57
Subtotal well supervised	1,757	1,757	10	106	32	22	24	6	60
1st and 2nd trimesters only	40	39	1	8	1	2	2	25	205
1st and 3rd "	34	31	3	3	1	7	1	88	97
3rd trimester only.....	982	979	3	76	18	7	17	3	78
2nd "	139	134	5	12	2	11	3	36	90
1st "	53	52	1	4	1	2	1	19	77
Subtotal partially supervised.....	1,248	1,235	13	103	22	28	23	10	83
Total supervised	3,015	2,992	23	209	54	50	47	8	70
If supervised, when unknown.....	617	611	6	65	11	13	15	10	106
Total reported	3,632	3,603	29	274	65	63	62	8	76
Not reported	1,966	1,949	17	170	35	37	38	9	87
Total probably not supervised.....	2,583	2,560	23	235	46	50	53	9	92
Grand total	5,598	5,552	46	444	100	100	100	8	80

Table 19

Maternal and Child Health Survey 1962
Influence on Mortality of Attendance at Pre-natal Clinics

Period of attendance at pre-natal clinics	Number of births		Mortality		Percentage Distribution			Mortality Rates	
	All births	Born alive	Still born	Died in first year	All births	Still births	Died in first year	Still births per 1000 births	Infant mortality per 1000 live births
All three trimesters.....	679	674	5	38	12	11	9	7	56
2nd and 3rd trimesters.....	1,024	1,018	6	53	18	13	12	6	52
Subtotal of good attenders.....	1,703	1,692	11	91	30	24	20	6	54
1st and 2nd trimesters only	24	24	0	4	0	0	1	0	167
1st and 3rd trimesters only.....	62	59	3	4	1	7	1	48	68
3rd trimester only.....	1,284	1,279	5	96	23	11	22	4	75
2nd trimester only	156	153	3	12	3	7	3	19	78
1st trimester only.....	80	80	0	4	1	0	1	0	50
Subtotal of irregular attenders....	1,606	1,595	11	120	29	24	27	7	75
Total attenders.....	3,309	3,287	22	211	59	48	48	7	64
If attended, when unknown.....	497	492	5	52	9	11	12	10	106
Total reported.....	3,806	3,779	27	263	68	59	59	7	70
Not reported	1,792	1,773	19	181	32	41	41	11	102
Total probably not attending	2,289	2,265	24	233	41	52	52	10	103
Grand Total.....	5,598	5,552	46	444	100	100	100	8	80

Maternal and Child Health Survey 1962
Influence on Mortality of Taking Supplements to Diet

Supplement	Taken during	Number of Births		Mortality		Percentage Distribution			Mortality Rates per 1000 births	
		Total births	Born alive	Still born	Died in first year	Total births	Still births	Died in first year	Still birth rate	Infant Mortality Rate
Pre-natal capsules only	All three trimesters.....	29	26	3	3	1	7	1	103	115
	2nd and 3rd " only	20	17	3	5	0	7	1	150	294
	1st and 2nd " "	0	0	0	0	0	0	0	0	0
	1st " 3rd " "	2	2	0	0	0	0	0	0	0
	3rd trimester only	8	7	1	2	0	2	0	125	286
	2nd " "	130	124	6	23	2	13	5	46	185
subtotal	1st " "	0	0	0	0	0	0	0	0	0
	taking at any time	189	176	13	33	3	28	7	69	188
Other supplements only (no capsules)	All three trimesters.....	1,995	1,995	0	107	36	0	24	0	54
	2nd and 3rd " only	308	305	3	42	6	7	9	10	138
	1st " 2nd " "	0	0	0	0	0	0	0	0	0
	1st " 3rd " "	0	0	0	0	0	0	0	0	0
	3rd trimester only	0	0	0	0	0	0	0	0	0
	2nd " "	0	0	0	0	0	0	0	0	0
	1st " "	0	0	0	0	0	0	0	0	0
	taking at any time	2,303	2,300	3	149	41	7	34	1	65
pre-natal capsules and other supplements	All three trimesters.....	2,062	2,060	2	121	37	4	27	1	59
	2nd and 3rd " only	94	92	2	12	2	4	3	21	130
	1st " 2nd " "	0	0	0	0	0	0	0	0	0
	1st " 3rd " "	0	0	0	0	0	0	0	0	0
	3rd trimester only	1	1	0	0	0	0	0	0	0
	2nd " "	0	0	0	0	0	0	0	0	0
	1st " "	0	0	0	0	0	0	0	0	0
subtotal	taking at any time	2,157	2,153	4	133	39	9	30	2	62
Not reported	Reported as "unknown"	54	53	1	7	1	2	2	19	132
	presumed not to have taken	895	870	25	122	16	54	27	28	140
Grand total		5,598	5,552	46	444	100	100	100	8	80

Maternal and Child Health Survey 1962
Dental Supervision

Received Dental attention during	Number of Births		Mortality		Percentage Distribution			Mortality Rates per 1000 births	
	Total births	Born alive	Still born	Died in first year	Total births	Still births	Died in first year	Still birth rate	Infant Mortality rate
All three trimesters.....	58	57	1	2	1	2	0	17	35
2nd and 3rd " only	18	18	0	1	0	0	0	0	56
1st and 2nd " ".....	4	4	0	2	0	0	0	0	500
1st and 3rd " ".....	4	4	0	0	0	0	0	0	0
3rd trimester only	130	130	0	10	2	0	2	0	77
2nd " ".....	108	108	0	12	2	0	3	0	111
1st " ".....	52	52	0	4	1	0	1	0	77
subtotal receiving dental care.....	374	373	1	31	7	2	7	3	83
Reported as "unknown"	1,067	1,056	11	85	19	24	19	10	80
No report.....	4,157	4,123	34	328	74	74	74	8	80
subtotal presumed not treated	5,224	5,179	45	413	93	98	93	9	80
Grand total	5,598	5,552	46	444	100	100	100	8	80

Maternal and Child Health Survey 1962
Influence on Mortality of Duration of Post-Natal
Nursing Supervision

Post-Natal Supervision by a Nurse	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 births
	Live Births	Died in First year	Live Births	Died in first year	
For 1 month	166	33	3 (5)	7 (20)	199
" 2 months	221	29	4 (6)	7 (18)	131
" 3 "	236	29	4 (7)	7 (18)	123
" 4 "	227	20	4 (6)	5 (12)	88
" 5 "	162	17	3 (4)	4 (10)	105
" 6 "	377	13	7 (10)	3 (8)	34
" 7 "	149	3	3 (4)	1 (2)	20
" 8 "	274	7	5 (8)	2 (4)	26
" 9 "	222	2	4 (6)	0 (1)	9
" 10 "	269	4	5 (7)	1 (2)	15
" 11 "	89	2	1 (2)	0 (1)	22
" 12 "	1,209	4	22 (34)	1 (2)	3
subtotal attended	5,601	142	65(100)	37(100)	45
Not attended	264	36	5	8	136
"Unknown"	61	3	1	0	49
Not reported	1,626	242	29	55	149
Grand Total	5,552	444	100	100	80

Maternal and Child Health Survey 1962
Influence on Mortality of Duration of Post-Natal
Physician Attention

Post-Natal Supervision by a Physician	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 births
	Live Births	Died in first year	Live Births	Died in first year	
For 1 month.....	228	18	4	4	79
For 2 months.....	236	17	4	4	72
" 3 "	179	11	3	2	61
" 4 "	111	7	2	2	63
" 5 "	65	4	1	1	62
" 6 "	120	3	2	1	25
" 7 "	24	1	0	0	42
" 8 "	57	1	1	0	18
" 9 "	29	2	0	0	69
" 10 "	60	1	1	0	17
" 11 "	10	1	0	0	100
" 12 "	459	0	8	0	0
Subtotal attended	1,578	66	28	15	42
Not attended	342	24	6	5	70
"Unknown"	64	4	1	1	63
Not reported.....	3,568	350	64	79	98
Grand Total	5,552	444	100	100	80

Table 24

Maternal and Child Health Survey 1962
Influence on Mortality of Giving Mothers
some Instruction by Nurses

Instruction	Numbers		Percentage Distribution		Infant Mortality Rate per 100 births
	Live Births	Died in first year	Live Births	Died in first year	
Given	4,050	226	73	51	56
Not Given	407	56	7	13	138
Uncertain.....	1,100	162	20	36	147

Table 25

Maternal and Child Health Survey 1962
Influence on Infant Mortality of Breast Feeding

Duration of Breast Feeding	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 Live Births
	Live Births	Died in first year	Live Births	Died in first year	
Under 1 month	1,821	132	33	30	72
1 month but under 2 months	252	33	5	7	131
2 months but under 3 months	246	17	4	4	69
Subtotal breast fed for less than 3 months	2,319	182	42	41	78
3 months but under 4 months	185	15	3	3	81
4 months but under 5 months	134	7	2	2	52
5 months but under 6 months	210	9	4	2	43
Subtotal breast fed for 3 but under 6 months.....	529	31	9	7	59
Total breast fed less than 6 months	2,848	213	51	48	75
6 months but under 7 months	67	2	1	1	30
7 months or more	937	15	17	3	16
Total breast fed for 6 months or more.....	1,004	17	18	4	17
Total known to have some breast feeding	3,852	230	69	52	60
If breast fed, when unknown	168	7	3	2	42
Total reported	4,020	237	72	53	59
Not reported	1,532	207	28	47	135
Total probably not breast fed	1,700	214	31	48	126
Grand total	5,552	444	100	100	80

Maternal and Child Health Survey 1962
Influence on Mortality of Supervision of Bottle Feeding

Feeding	Supervision	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 live births
		Born alive	Died in first year	Live births	Died in first year	
Bottle fed	Reported Not supervised	663	34	12	7	51
	Not reported.....	1,123	270	20	61	240
	Subtotal (?) not supervised...	1,786	304	32	68	170
	Reported supervised.....	2,762	123	50	28	45
	Subtotal Bottle fed	4,548	427	82	96	94
reported to have been breast fed for six months.....		1,004	17	18	4	17
Grand total.....		5,552	444	100	100	80

Table 27

Influence on Mortality of Post-Weaning Feeding
by Quantity of Food
(based on positive reports only)

Quality of Food	Quality of Food	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 live births
		Infants	Died	Infants	Died	
Regarded as sufficient (by nurse)	Good.....	2,735	62	70	53	23
	Poor.....	136	3	4	3	22
	Subtotal given enough.....	2,871	65	74	56	23
Regarded as insufficient (by nurse)	Good.....	228	2	6	2	9
	Poor.....	610	39	16	33	64
	Subtotal getting too little....	838	41	22	35	49
Unknown	Good.....	88	3	2	3	34
	Poor.....	11	1	0	0	91
	Subtotal.....	99	4	2	3	40
Unknown	Uncertain.....	77	6	2	5	78
Grand total		3,885	116	100	100	30

Table 28

Influence on Mortality of Post-Weaning Feeding
by Quality of Food

Quality of Food	Quantity of Food	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 births
		Live Births	Died in first year	Live Births	Died in first year	
Good	Sufficient	2,735	62	70	53	23
	Insufficient	228	2	6	2	9
	Unknown	88	3	2	3	34
	Subtotal	3,051	67	78	58	22
Poor	Sufficient	136	3	4	3	22
	Insufficient	610	39	16	33	64
	Unknown	11	1	0	1	91
	Unknown	757	43	20	37	57
Uncertain	Unknown	77	6	2	5	78
All qualities	Total	3,885	116	100	100	30

Maternal and Child Health Survey 1962
Influence on Mortality of Supplementing Infant's Feeding with
Indian Health Service Vitamin Capsules

Vitamins given for	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 Live Births
	Live Births	Died in First Year	Live Births	Died in First Year	
Under 1 month	318	33	6	7	104
1 but under 2 months.....	117	22	2	5	188
2 but under 3 months.....	154	23	3	5	149
3 but under 4 months.....	198	26	3	6	131
subtotal for 1 to 3 months	469	71	8	16	151
4 but under 5 months.....	175	16	3	4	91
5 but under 6 months.....	98	15	2	3	153
6 but under 7 months.....	394	9	7	2	23
subtotal for 4 to 6 months	667	40	12	9	60
7 but under 8 months.....	109	4	2	1	37
8 but under 9 months.....	230	4	4	1	17
9 but under 10 months.....	219	0	4	0	0
subtotal for 7 to 9 months	558	8	10	2	14
10 but under 11 months.....	399	5	7	1	13
11 but under 12 months.....	505	2	9	0	4
full 12 months	855	4	15	1	5
subtotal for 10 to 12 months	1,759	11	32	2	6
Total treated	3,771	163	68	37	43
No record	1,781	281	32	63	158
Grand total	5,552	444	100	100	80

Maternal and Child Health Survey 1962
Influence on Mortality of Supplementing Infant's Feeding with
Indian Health Service Iron Paediatric Drops

Iron Drops given for	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 live births
	Live Births	Died in first year	Live Births	Died in first year	
Under 1 month	593	35	11	8	59
1 but under 2 months.....	171	8	3	2	47
2 but under 3 months.....	264	9	5	2	34
3 but under 4 months.....	281	14	5	3	50
subtotal for 1 to 3 months	716	31	13	7	43
4 but under 5 months.....	187	6	3	1	32
5 but under 6 months.....	72	5	1	1	69
6 but under 7 months.....	172	3	3	1	17
subtotal for 4 to 6 months	431	14	7	3	32
7 but under 8 months.....	43	0	1	0	0
8 but under 9 months.....	79	1	1	0	13
9 but under 10 months.....	97	2	2	0	21
subtotal for 7 to 9 months	219	3	4	1	14
10 but under 11 months.....	157	2	3	0	13
11 but under 12 months.....	60	0	1	0	0
full 12 months	161	1	3	0	6
subtotal for 10 to 12 months	378	3	7	1	8
Total treated	2,337	86	42	19	37
No record	3,215	358	58	81	111
Grand total.....	5,552	444	100	100	80

Table 31

Maternal and Child Health Survey 1962
Influence on Mortality of Quality of Home Care

Quality of Home Care	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 live births
	Live Births	Died in first year	Live Births	Died in first year	
Adequate.....	2,328	75	42	17	32
Inadequate	1,756	161	31	36	92
Fair.....	65	5	1	1	77
Undetermined	42	3	1	1	71
subtotal reported.....	4,191	244	75	55	58
Not reported.....	1,361	200	25	45	147
Grand total.....	5,552	444	100	100	80

Table 32

Factors Affecting Quality of Home Care Adversely

Nature of Adverse Factor	Numbers		Percentage Distribution		Infant Mortality Rate per 1000 live births
	Live Births	Died in first year	Live Births	Died in first year	
Abuse of alcohol.....	554	46	10	10	83
Overcrowding.....	986	81	18	18	82
Poor Housing.....	949	86	17	19	91
Poor Sanitation	1,018	96	18	22	94
Unsafe Water	415	40	7	9	96
Insufficient water	402	21	7	5	52
Parental apathy.....	634	64	11	14	101
Maternal ill-health	141	12	3	3	85
Other illness in home.....	115	8	2	2	70
Improper use of means	608	59	11	13	97
Other factors (not specified)	323	27	6	6	84
Total affected	* 1,835	163	33	37	89
No adverse factors reported	3,717	281	67	63	76
Grand Total	5,552	444	100	100	80

*This figure is not the sum of children affected by each separate factor.
Several factors were operative in the same case in many instances.

Maternal and Child Health Survey 1962
Comparison of Mortality Rates in Selected Categories of Children

Categories of Children	Numbers		Percentages Distribution		Mortality Rate per 1000 at risk
	Children at risk	Total deaths in groups	Children at risk	Mortality	
All children born alive.....	5,552	444	100	100	79.97
Children who survived to be six months or more.....	5,202	94	94	21	18.07
Children breast fed for six months or more.....	1,004	17	18	4	16.93
Children given vitamins for six months or more.....	2,711	28	49	6	10.33
Children given iron drops for six months or more.....	769	9	14	2	11.70
Children getting nursing post natal care for six mths or more...	2,589	35	47	8	13.52
Children getting physician post natal care for six mths or more..	759	9	14	2	11.86

Note: The categories are not mutually exclusive. Reduced mortality can not properly be ascribed to any one stated treatment alone but post-natal care in general was undoubtedly effective.

those considered to be getting poor home care. The two groups were approximately of the same size and the difference is statistically significant. It is interesting to note, however that among the total group reported, 4191 children or 75% of all born, mortality was only 58 per 1000 as against 147 per 1000 among the unreported group. This 75%, including the bad homes, must constitute the group under closest nursing supervision and the other 25% a group that escapes or does not accept the services offered. As pointed out before, this group contributed nearly as many deaths, 200, as the other three quarters, 244. This feature has appeared repeatedly.

Factors affecting quality of home care adversely and infant mortality

In 18% of all infants born alive overcrowding and poor sanitation were reported as militating against good home care, in 17% poor housing. In 11% of cases parental apathy and misuse of family means were held at fault. In 10% of all births, abuse of alcohol was judged responsible for the poor quality of home care. Deficient and unsafe water supplies were the difficulty in 7% of cases respectively. Sickness in the home affected 5% of children. The proportion of children affected by all factors was 33% as against the 31% reported to be having inadequate home care in the preceding table, almost exactly the same number as reported to have "inadequate", "fair" and "undetermined" quality of home care. More than one factor was operative in most cases, compounding the effect. With one interesting exception, inadequate water, all factors were associated with a relatively high infant mortality rate although the difference in the total group affected by adverse factors is not statistically significantly higher than the mortality experienced among the group in which adverse factors were not reported, the Chi squared test giving an index of 2.92. The reason for this is probably that adverse factors were operative in the unreported group also. Unfortunately the questionnaire did not ask for a positive report on the absence of adverse factors, with the result that blank returns do not necessarily mean nothing was wrong. They include those cases in which the nurse was unable to assess the home. It is highly probable that more than the reported 33% of Indian infants suffer from deficiencies in the home but, at least, these deficiencies have been identified in one third of all Indian births in 1962. The highest mortality rate was, as might be expected, associated with parental apathy (101 per 1000). The next most dangerous factor was improper use of means but unsafe water, poor sanitation and poor housing were all associated with mortality rates of well over 90 per 1000.

FACTORS AFFECTING SELECTED CAUSES OF INFANT DEATHS

Causes of death selected for special study

Deaths ascribed to respiratory diseases, gastro-enteritis, immaturity and accidents were selected for special study as these causes of death always featured as the major factors in producing the high Indian infant mortality. No other single cause of infant mortality has ever shown anything like the mortality rates associated with these. Deaths from preventable communicable diseases were included as, hopefully, providing some index to the success or failure of the immunisation programs. In 1962, "preventable diseases" included smallpox, diphtheria, tetanus, pertussis and poliomyelitis but excluded measles which has since been included. That the choice of causes of death selected as most important was fully justified is witnessed by the fact that, in this survey, these five causes accounted for almost 78% of the total infant mortality. Only 15% of deaths were certified as due to other causes. In 29 cases or 7% of the total mortality, the cause of death could not be ascertained. It would be quite reasonable to assume that the real causes of death in these 29 cases were distributed in the same relative proportions as among the known

cases, in which case a further 22 deaths could reasonably be ascribed to the five major causes, making the total covered 369 or over 83% of the total mortality. Probably no more than 17% of infant deaths could have been attributed to other causes.

Preventable diseases

Only two infants were reported as dying from preventable diseases. Two deaths out of 5552 children at risk, a mortality rate of 36 per 100,000, would seem to indicate the immunisation programs had been very successful. Both deaths occurred towards the end of the first year of life when maternal antibodies would have disappeared. The diseases to which these children succumbed were not specified but, in view of the fact that a significant proportion of Indian infants seemed to escape close follow up by the nurses conducting the immunisation programs, as suggested by previous studies, this is a strikingly low mortality. Subsequent studies will examine the level of immunisation actually achieved but the death rate from preventable diseases would suggest that the situation is well under control. Had measles and, particularly, tuberculosis been included as "preventable", as they now are, the picture might not have been quite so gratifying.

Distribution of the four major causes of death

Respiratory diseases were outstandingly much the most significant cause of infant death, accounting for 44% of the total infant mortality. Among deaths occurring during the sixth and seventh months of life these diseases accounted for 68% of the mortality. By comparison gastro-enteritis appeared relatively insignificant, accounting for only 9% of the total deaths but, in the latter months of life it became much more significant, accounting for one third of the deaths occurring in the tenth month of life, one quarter of the deaths in the ninth month and one fifth of the deaths occurring in the eighth and eleventh months of life. This is the period in an infant's life when he not only subsists on a diet more nearly approximating that of his parents but is more mobile and is therefore more susceptible to defective domestic hygiene. Immaturity accounted for as much as 18% of the total mortality, 70% of the deaths on the day of birth, 26% of deaths in the rest of the first month of life and 4% of deaths in the second month of life. Accidents accounted for 6% of the deaths, a surprisingly high figure when it is recalled that infants are not normally exposed to risk of accidents to the same degree as other age groups. It is even more striking that 63% of fatal accidents occurred during the first three months of life, 22% during the second three months of life, before the infants were mobile, only 15% in the second six months of life. This is an unusual pattern of distribution for accidental deaths.

Deaths from all causes tended to be concentrated in the first three months of life, 43% from respiratory diseases, 46% of deaths from gastro-enteritis, 96% of deaths from immaturity and, as mentioned, 63% of the fatal accidents. A further 30% of deaths from respiratory diseases occurred in the second three months of life, so that almost three quarters of deaths from respiratory diseases occurred during the first six months of life. About 63% of deaths from gastro-enteritis also occurred during this period but 20% occurred in the fourth three months of life as compared with 10% of respiratory diseases.

The specific mortality rate for respiratory diseases was 35.5 per 1000 at risk. During the first three months of life it was 15 per 1000 at risk, dropped to 11 per 1000 in the second three months then to 6 and 4 respectively in the third and fourth trimesters. Gastro-enteritis was also most fatal in the first three months of life although more significant as a cause of death later in life. Unquestionably the first three months of an Indian infant's life were much the most critical. The age specific

mortality rate during this period was 45 per 1000 live births as contrasted with a rate of 8 per 1000 at risk during the fourth three months of life. During this period, respiratory diseases posed the greatest hazard.

Calendar month of death

In this study the calendar month of death includes deaths occurring in each calendar month in 1962 and 1963 among the group born in 1962. It was included as an index to the influence, if any, of seasonal changes on infant mortality. A rearrangement of the months is used in the summary table at the end of this section in which the months are arranged by the seasons as usually accepted in Canada, winter being December, January and February, spring March, April, May, etc. As might be expected, mortality was highest in the winter months but almost as high in the summer and only slightly lower in the spring and a little lower still in the fall. This reflects the predominant influence of the mortality from respiratory diseases. The seasonal characteristics of the mortality from respiratory diseases is most clearly shown in the summary table of comparisons, the mortality rates being 12 per 1000 live births in the winter, 6.3 per 1000 in the spring, 9 per 1000 in the summer and 8 per 1000 in the fall. The peak month was December when the infant mortality from respiratory diseases was at the rate of 4.3 per 1000 live births. Mortality from gastro-enteritis was greatest in the summer, the specific rate being 2.3 per 1000 live births, and the lowest in the winter at a rate of 1.4 per 1000. In the spring and fall the specific infant mortality rate for gastro-enteritis was 1.8 per 1000 live births. The peak month was July. The most interesting feature in this analysis is that the seasonal changes appear to have made so relatively little change in mortality rates. A greater effect might have been expected. The peak month for deaths from immaturity was September, for accidents, December but the concentration of deaths in that month is not particularly significant. The two deaths from preventable diseases occurred in the warmer weather.

Calendar month of birth

Although, as with the month of death, the variations in mortality associated with the season of birth are moderate yet this table shows some intriguing trends which are brought out a little more clearly in regard to respiratory diseases and gastro-enteritis in the summary table of comparisons. The highest mortality rate from respiratory diseases occurred among children born in the summer and the highest mortality rate from gastro-enteritis occurred among children born in the winter, particularly the month of January. The exact opposite might well have been expected until it is realised that children born in the summer would still be in the sensitive early months of life at the onset of the more severe winter weather and children born in the winter months would be in the weaning process in the summer. It was noted above that mortality from respiratory diseases was highest in the winter months. The heaviest mortality rate from respiratory diseases was actually amongst the children born in November who, of course, would have to live all three of their most vulnerable first three months through the severest weather. Another interesting observation is that mortality from immaturity showed a definite concentration among children born in September. These children would have been conceived during the winter months when parental nutrition and vitality might well have been at its lowest ebb. Immature deaths were least frequent among children born in November and December who, presumably, would have been conceived in the spring or early summer when the opposite would be the case. Accidents tended to concentrate among children born in February but, as shown in the previous table, occurred more often in the month of December. Other causes of death showed a slight tendency to be concentrated amongst the winter born infants.

The percentage of deaths due to respiratory diseases was high in every cohort of children born each month but it was particularly high among children born in August (64%) and lowest (35%) among children born in March. The greatest percentage of all children dying of respiratory diseases had also been born in August. Gastro-enteritis accounted for more of the deaths of children born in January than in any other month (14%) and was least amongst children born in May (3%). September showed the highest infant mortality rate from immaturity, as mentioned in the preceding study, and children born in September also had the highest infant mortality from that cause, the highest percentage of all deaths from immaturity and 31% of the deaths among children born in September was due to immaturity, second only to the 36% of deaths ascribed to respiratory diseases. The month or season in which a child is born or even conceived does therefore seem to have some bearing on the type of hazard most likely to threaten him.

Duration of pregnancy

The duration of pregnancy had a very marked influence on the mortality rates from respiratory diseases and gastro-enteritis. Infants with less than seven months duration of pregnancy had an immaturity mortality rate of 842 per 1000 born alive and 105 for respiratory diseases. Those with seven but less than eight months pregnancy had an immaturity mortality rate of 306 per 1000 born alive and, for respiratory diseases 69.4. Those who were born after eight months pregnancy but still less than nine months had an immaturity mortality rate of 52 and for respiratory diseases, 66 per 1000 born alive. In sharp contrast, those with nine months pregnancy had an immaturity death rate of only 2.9 per 1000 born alive and 33.6 for respiratory diseases. Dividing all live births into those born with less than nine months pregnancy and those with nine or more, the mortality rate from respiratory diseases in the first (premature) group was 71.4 per 1000 born alive as against 33.3 per 1000 in the mature group. For gastro-enteritis the mortality rates were 9.3 and 7.3 respectively, a less significant difference. Prematurity undoubtedly rendered an infant less resistant to infection, however, 88% of the deaths from respiratory diseases occurred among children born with full term pregnancies and as much as 18% of the deaths ascribed to "immaturity". Not so surprisingly perhaps, 89% of the children dying who had been born with less than seven months pregnancy were said to have died of "immaturity", 11% of "respiratory diseases".

Birth weight

The mortality rate for respiratory diseases among children of less than 6 lbs weight at birth was 89 per 1000 born alive compared with 29 among those weighing 6 or more lbs at birth. The influence on deaths from gastro-enteritis was negative, the respective rates being 6.7 per 1000 infants born weighing less than 6 lbs and 7.5 per 1000 weighing 6 lbs or more at birth. The influence of low birth weight was most clearly seen in the mortality ascribed to "immaturity". 90% of the infants dying of immaturity weighed less than 6 lbs at birth.

Complicated delivery

Complicated deliveries had little or no effect on mortality from the causes under discussion. The numbers involved were relatively too small to have much statistical significance yet it is interesting to note that the mortality rate from respiratory diseases among children whose births were complicated by placenta praevia was 89 per 1000 and, amongst those whose birth was complicated by malposition or disproportion, 140 per 1000, as compared with 35 for all births. More significantly perhaps, the mortality rate for deaths from "immaturity" among children whose births were complicated by placenta praevia was

133 per 1000 so born, compared with 14 per 1000 for all live births. A causative association is more clearly plausible in this instance but six deaths out of forty-five such births do not offer a sound basis for any definite conclusions.

Adequacy of home care

Adequacy of home care showed a very marked influence on the mortality rates. The mortality rate for respiratory diseases amongst children getting inadequate care at home was 49.4 per 1000 as against 16.3 among those reported as getting good home care. Roughly two thousand children were ascribed to each of those groups and the difference is highly significant. The same sharp difference is shown in regard to gastro-enteritis, accidents and even deaths from immaturity. For gastro-enteritis the respective death rates were 16 as against 3 per 1000, for accidents 7 as against 4 and, for immaturity 51 per 10,000 as against 17. Only 19% of the deaths from respiratory diseases occurred in children getting good attention at home and 17% of the deaths from gastro-enteritis, only 5% of the immaturity and one third of the fatal accidents. However, over half the deaths that did occur in good homes were due to respiratory diseases, 9% to gastro-enteritis, 12% to accidents, 16% to causes other than those under specific study.

Specific effects of certain adverse factors

Mortality from respiratory diseases was sharply elevated in homes affected by parental apathy (60 per 1000) poor sanitation (56 per 1000) and abuse of alcohol (54 per 1000), overcrowding, poor housing and improper use of available means (each 50 per 1000). Not very surprisingly the highest death rates from gastro-enteritis were in homes affected by unsafe water (27 per 1000) and poor housing (20 per 1000) but improper use of means also produced a mortality rate of 20 per 1000 at risk and parental apathy a rate of 19 per 1000 at risk. By far the major factor in producing immature mortality was maternal ill health and the higher fatal accident rates were in homes affected by improper use of available means (10 per 1000) poor housing (8.4 per 1000) maternal ill health, overcrowding and poor sanitation (each 7 per 1000) and, not surprisingly, parental apathy (6 per 1000). Sickness in the home, unsafe water, maternal ill health, improper use of means and overcrowding featured in association with high mortality rates from other causes.

One quarter of all deaths from respiratory diseases occurred in overcrowded homes, 29% of all deaths from gastro-enteritis in homes affected by parental apathy and improper use of means and 27% in homes with unsafe water supplies but 46% occurred in poor housing conditions and bad sanitation. The greatest proportion of fatal accidents occurred in overcrowded poor homes with bad sanitation but 15% were associated with parental apathy.

In homes affected by adverse factors in general 55% of the mortality was due to respiratory diseases, 17% to gastro-enteritis, 6% to immaturity, 7% to accidents and 15% to other causes of death, but in homes affected by abuse of alcohol, 65% of the infant deaths were due to respiratory diseases, 15% to gastro-enteritis, 9% to immaturity. In homes affected by parental apathy 59% of the infant deaths were due to respiratory diseases, 19% to gastro-enteritis and 6% to accidents, 9% to other causes. In homes affected by sickness in the home, 63% of the infant deaths were due to respiratory diseases and 25% to "other causes of death", 12% to gastro-enteritis. In homes affected by dangerous water supplies half the deaths were due to respiratory diseases, 28% to gastro-enteritis, 18% to "other causes". In overcrowded homes 60% of the deaths were due to respiratory diseases, 12% to gastro-enteritis, 9% to accidents, 14% to "other causes".

In homes where no adverse factors were reported, 38% of the deaths were due to respiratory diseases, 5% to gastro-enteritis, 25% to immaturity, 5% to accidents and 26% to other causes.

Breast feeding

Continued breast feeding was associated with a reduction in mortality rates. Children breast fed for less than three months had a mortality rate of 43 per 1000 at risk from respiratory diseases but those breast fed for six months had a respiratory diseases death rate of 14.9 per 1000 at risk while those breast fed for seven months or more had a death rate of 10.7 per 1000. All children who survived for six months, whether or not breast fed, had a mortality rate from all causes of 18.07 per 1000 at risk while those who were breast fed for that period had a mortality rate from all causes of 16.93 per 1000 at risk. Children who were breast fed for less than three months had a mortality rate from gastro-enteritis of 7 per 1000 at risk but those breast fed for six months had a mortality rate of 5 per 1000. Interestingly enough, children breast fed for less than three months had a fatal "accident" mortality rate of 8 per 1000 at risk but those breast fed from 3 to 6 months or longer had an "accident" mortality rate of only 1.3 per 1000. The surprisingly large number of "accidents" that happened to children under the age of three months has already been mentioned. Out of all deaths from respiratory diseases, 51% occurred among children breast fed for less than three months, only 15% among those breast fed for over three months. Of all deaths from gastro-enteritis, 39% were among babies breast fed for less than three months, 20% among those breast fed for longer. However, most disappointingly, 60% of the deaths among children breast fed for over three months were due to respiratory diseases and 17% to gastro-enteritis while 55% of the deaths of children breast fed for less than three months were due to respiratory diseases and 9% to gastro-enteritis, 21% were due to other causes, 10% to accidents.

Post-natal nursing supervision

The death rate from respiratory diseases among children receiving post-natal nursing supervision of artificial feeding was 27.5 per 1000 but among those not supervised it was 61.6 per 1000. For gastro-enteritis, among the supervised group, the death rate was 6.9 per 1000 as against 9.5 among the unsupervised group. The accident mortality rate among the supervised group was 2.5 per 1000 at risk, in the unsupervised group 11.2.

Weaning diets

Among children weaned on good quality food the death rate from respiratory diseases was 12.5 per 1000 at risk, among those weaned onto poor quality food, it was 34.3. For gastro-enteritis, the respective rates were 1.6 and 10.6, a very significant difference. 78% of the total infants born alive were weaned onto good diets and this group contributed only 56% of the deaths from respiratory diseases and 38% of the gastro-enteritis deaths. The 20% weaned onto poor quality diets contributed 38% of deaths due to respiratory diseases and 62% of the gastro-enteritis deaths.

Maternal and Child Health Survey 1962
 Certain Selected Specific Mortality Rates Compared

Categories	Number of children at risk	Respiratory Diseases		Gastro-intestinal diseases	
		Number of deaths	Death Rate per 10,000	Number of deaths	Death Rate per 10,000
Totals	5,552	197	355	41	74
Children born in December	376	10	266	3	80
" " " January	504	19	377	6	119
" " " February	468	18	385	3	64
Children born in Winter	1,348	47	349	12	89
Children born in March	520	17	327	6	115
" " " April	476	20	420	3	63
" " " May	485	13	268	1	21
Children born in Spring	1,481	50	338	10	68
Children born in June	507	15	296	3	59
" " " July	467	19	407	3	64
" " " August	482	21	436	2	41
Children born in Summer	1,456	55	378	8	55
Children born in September	415	13	313	4	96
" " " October	419	15	358	4	95
" " " November	389	17	437	3	77
Children born in the Fall	1,223	45	368	11	90
Mortality in December	5,552	24	43	2	4
" " January	5,552	21	38	4	7
" " February	5,552	22	40	2	4
Mortality in Winter	5,552	67	121	8	14
Mortality in March	5,552	9	16	2	4
" " April	5,552	15	27	5	9
" " May	5,552	11	20	3	5
Mortality in Spring	5,552	35	63	10	18
Mortality in June	5,552	14	25	3	5
" " July	5,552	16	29	5	9
" " August	5,552	20	36	5	9
Mortality in Summer	5,552	50	90	13	23
Mortality in September	5,552	18	32	4	7
" " October	5,552	9	16	3	5
" " November	5,552	18	32	3	5
Mortality in Fall	5,552	45	81	10	18
Children born with complicated labour ...	525	17	324	2	38
" " without " " ...	5,027	180	358	39	78
Children getting adequate home care	2,328	38	163	7	30
" not " " " " " 	1,863	92	494	29	156
Children born under 9 months pregnancy .	322	23	714	3	93
Children with 9 or more " " .	5,230	174	333	38	73
Children of less than 6 lbs. birth weight .	595	53	891	4	67
Children of 6 lbs or more " " .	4,957	144	290	37	75
*Children breast fed for less than 3 mths..	4,019	168	418	33	82
Children breast fed for 3 mths or more ...	1,533	29	189	8	52
Artificial feeding supervised	2,762	76	275	19	69
Artificial feeding not supervised	663	22	332	5	75

*Including those not breast fed

βPositive reports only

Maternal and Child Health Survey 1962

Specific Mortality Rates for Selected Causes of Death by Duration of Life

Duration of Life	Number of Children at risk	All Causes of Death		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable Infectious diseases		Other Specified causes		Cause of death not specified	
		Number of deaths	Rate per 1000	Number of deaths	Rate per 1000	Number of deaths	Rate per 1000	Number of deaths	Rate per 1000	Number of deaths	Rate per 1000	Number of deaths	Rate per 1000	Number of deaths	Rate per 1000	Number of deaths	Rate per 1000
Under 1 day	5,552	74	13	7	1	0	0	52	9	0	0	0	0	10	2	5	1
" 1 mth.....	5,478	85	16	28	5	6	1	22	4	6	1	0	0	16	3	7	1
" 2 mths.....	5,303	49	9	23	4	7	1	2	0	8	1	0	0	5	1	4	1
" 3 mths.....	5,344	44	8	27	5	6	1	1	0	1	1	0	0	4	1	3	1
1st — 3 mths.....	5,552	252	45	85	15	19	3	77	14	17	3	0	0	35	6	19	3
Under 4 mths.....	5,300	36	7	23	4	1	0	1	0	3	1	0	0	6	1	2	0
" 5 ".....	5,264	34	6	17	3	5	1	1	0	1	0	0	0	7	1	3	1
" 6 ".....	5,260	28	5	19	4	1	0	0	0	2	0	0	0	4	1	2	0
4th — 6th mths.....	5,300	98	18	59	11	7	1	2	0	6	1	0	0	17	3	7	1
Under 7 mths.....	5,202	27	5	18	3	1	0	0	0	1	0	0	0	6	1	1	0
" 8 ".....	5,175	16	3	10	2	3	1	0	0	0	0	0	0	2	0	1	0
" 9 ".....	5,159	12	2	5	1	3	1	1	0	1	0	0	0	2	0	0	0
7th — 9th mths.....	5,202	55	11	33	6	7	1	1	0	2	0	0	0	10	2	2	0
Under 10 mths.....	5,147	12	2	5	1	4	1	0	0	0	0	0	0	2	0	1	0
" 11 ".....	5,135	15	3	9	2	3	1	0	0	1	0	1	0	1	0	0	0
" 12 ".....	5,120	12	2	6	1	1	0	0	0	1	0	1	0	3	1	0	0
10th — 12 mths.....	5,147	39	8	20	4	8	2	0	0	2	0	2	0	6	1	1	0
Whole year.....	5,552	444	80	197	35	41	7	80	14	27	5	2	0	68	12	29	5

Maternal and Child Health Survey 1962
Percentage Distribution of Deaths from Selected Causes by Duration of Life

Duration of Life	All Causes		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable in- fectious diseases		Other specified causes		Cause of death not specified	
	Number of deaths	Percent- agedistri- bution of causes	Number of deaths	Percent- agedistri- bution of causes	Number of deaths	Percent- agedistri- bution of causes	Number of deaths	Percent- agedistri- bution of causes	Number of deaths	Percent- agedistri- bution of causes	Number of deaths	Percent- agedistri- bution of causes	Number of deaths	Percent- agedistri- bution of causes	Number of deaths	Percent- agedistri- bution of causes
Under 1 day.....	74	17	7	4	0	0	52	65	0	0	0	0	10	15	5	17
Under 1 mth.	85	19	28	14	6	15	22	28	6	22	0	0	16	24	7	24
" 2 mths.....	49	11	23	12	7	17	2	3	8	30	0	0	5	7	4	14
" 3 "	44	10	27	14	6	15	1	1	3	11	0	0	4	6	3	10
1st - 3rd mths.....	252	57	85	43	19	46	77	96	17	63	0	0	35	51	19	66
Under 4 mths.	36	8	23	12	1	2	1	1	3	11	0	0	6	9	2	7
" 5 ".....	34	8	17	9	5	12	1	1	1	4	0	0	7	10	3	10
" 6 ".....	28	6	19	10	1	2	0	0	2	7	0	0	4	6	2	7
4th - 6th mths.. ..	98	22	59	30	7	17	2	3	6	22	0	0	17	25	7	24
Under 7 mths.	27	6	18	9	1	2	0	0	1	4	0	0	6	9	1	3
" 8 "	16	4	10	5	3	7	0	0	0	0	0	0	2	3	1	3
" 9 "	12	3	5	2	3	7	1	1	1	4	0	0	2	3	0	0
7th - 9th Mths.....	55	12	33	17	7	17	1	1	2	7	0	0	10	15	2	7
Under 10 mths.	12	3	5	2	4	10	0	0	0	0	0	0	2	3	1	3
" 11 "	15	3	9	4	3	7	0	0	1	4	1	50	1	2	0	0
" 12 "	12	3	6	3	1	2	0	0	1	4	1	50	3	4	0	0
10th - 12th mths.....	39	9	20	10	8	20	0	0	2	7	2	100	6	9	1	3
Whole Year.....	444	100	197	100	41	100	80	100	27	100	2	100	68	100	29	100

Maternal and Child Health Survey 1962
Number of Deaths from Selected Causes in Cohort Dying
at each Month of Life

Causes of Death	Whole Year	1st day	Under 1 month	1-2 months	2-3 months	3-4 months	4-5 months	5-6 months	6-7 months	7-8 months	8-9 months	9-10 months	10-11 months	11-12 months
Respiratory diseases.....	197	7	28	23	27	23	17	19	18	10	5	5	9	6
Gastro-intestinal diseases.....	41	0	6	7	6	1	5	1	1	3	3	4	3	1
Immaturity.....	80	52	22	2	1	1	1	0	0	0	1	0	0	0
Accidents	27	0	6	8	3	3	1	2	1	0	1	0	1	1
Preventable infectious diseases.....	2	0	0	0	0	0	0	0	0	0	0	0	1	1
Other specified causes.....	68	10	16	5	4	6	7	4	6	2	2	2	1	3
Unspecified causes.....	29	5	7	4	3	2	3	2	1	1	0	1	0	0
Cohort dying.....	444	74	85	49	44	36	34	28	27	16	12	12	15	12

Percentage Distribution of Deaths from Selected Causes in Cohort Dying
at each Month of Life

Causes of Death	Whole Year	1st day	Under 1 month	1-2 months	2-3 months	3-4 months	4-5 months	5-6 months	6-7 months	7-8 months	8-9 months	9-10 months	10-11 months	11-12 months
Respiratory diseases.....	44	9	33	47	61	64	50	68	67	63	42	42	60	50
Gastro-intestinal diseases.....	9	0	7	14	14	3	15	4	4	19	25	33	20	8
Immaturity.....	18	70	26	4	2	3	3	0	0	0	8	0	0	0
Accidents	6	0	7	16	7	8	3	7	4	0	8	0	7	8
Preventable infectious diseases.....	1	0	0	0	0	0	0	0	0	0	0	0	7	8
Other specified causes.....	15	14	19	10	9	17	20	14	22	12	17	17	7	25
Unspecified causes.....	7	7	8	8	7	5	9	7	4	6	0	8	0	0
Total	100	100	100	100	100	100	100	110	100	100	100	100	100	100

Maternal and Child Health Survey 1962
Specific Mortality Rates for Selected Causes of Death by Calendar Month of Death

Calendar Month of Death	Number of Children at risk	All Causes of Death		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable Infectious diseases		Other Specified Causes		Cause of death not specified	
		Number of Deaths	Rate per 10,000	Number of Deaths	Rate per 10,000	Number of Deaths	Rate per 10,000	Number of Deaths	Rate per 10,000	Number of Deaths	Rate per 10,000	Number of Deaths	Rate per 10,000	Number of Deaths	Rate per 10,000	Number of Deaths	Rate per 10,000
January.....	5,552	41	74	21	38	4	7	5	9	2	4	0	0	6	11	3	5
February.....	"	47	85	22	40	2	4	7	13	4	7	0	0	8	14	4	7
March	"	34	61	9	16	2	4	8	14	1	2	0	0	11	20	3	5
1st Quarter.....	5,552	122	220	52	94	8	14	20	36	7	13	0	0	25	45	10	18
April.....	5,552	43	77	15	27	5	9	7	13	5	9	1	2	6	11	4	7
May	"	29	52	11	20	3	5	10	18	0	0	0	0	3	5	2	4
June	"	35	63	14	25	3	5	6	11	3	5	0	0	7	13	2	4
2nd Quarter	5,552	107	193	40	72	11	20	23	41	8	14	1	2	16	29	8	14
July	5,552	37	67	16	29	5	9	6	11	0	0	0	0	6	11	4	7
August	"	42	76	20	36	5	9	6	11	3	5	1	2	5	9	2	4
September.....	"	39	70	18	32	4	7	12	22	1	2	0	0	3	5	1	2
2nd Quarter.....	5,552	118	213	54	97	14	25	24	43	4	7	1	2	14	25	7	13
October	5,552	22	40	9	16	3	5	5	9	1	2	0	0	3	5	1	2
November.....	"	34	61	18	32	3	5	5	9	1	2	0	0	6	11	1	2
December	"	41	74	24	43	2	4	3	5	6	11	0	0	4	7	2	4
4th Quarter.....	5,552	97	175	51	92	8	14	13	23	8	14	0	0	13	23	4	7
Total	5,552	444	800	197	355	41	74	80	144	27	49	2	4	68	122	20	52

Maternal and Child Health Survey 1962
Percentage Distribution of Deaths from Selected Causes by Calendar Month of Death

Calendar Month of Death	All Causes		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable Infectious diseases		Other Specified Causes		Cause of death not specified	
	Number of deaths	Percent- age dis- tribution of causes	Number of deaths	Percent- age dis- tribution of causes	Number of deaths	Percent- age dis- tribution of causes	Number of deaths	Percent- age dis- tribution of causes	Number of deaths	Percent- age dis- tribution of causes	Number of deaths	Percent- age dis- tribution of causes	Number of deaths	Percent- age dis- tribution of causes	Number of deaths	Percent- age dis- tribution of causes
January.....	41	9	21	11	4	10	5	6	2	7	0	0	6	9	3	10
February.....	47	11	22	11	2	5	7	9	4	15	0	0	8	12	4	14
March.....	34	8	9	4	2	5	8	10	1	4	0	0	11	16	3	10
1st Quarter	122	27	52	26	8	20	20	25	7	26	0	0	25	37	10	34
April.....	43	10	15	8	5	12	7	9	5	19	1	50	6	9	4	14
May.....	29	7	11	6	3	7	10	13	0	0	0	0	3	4	2	7
June.....	35	8	14	7	3	7	6	8	3	11	0	0	7	10	2	7
2nd Quarter	107	24	40	20	11	27	23	29	8	30	1	50	16	24	8	28
July.....	37	8	16	8	5	12	6	8	0	0	0	0	6	9	4	14
August	42	9	20	10	5	12	6	8	3	11	1	50	5	7	2	7
September	39	9	18	9	4	10	12	15	1	4	0	0	3	4	1	3
3rd Quarter	118	27	54	27	14	34	24	30	4	15	1	50	14	20	7	24
October.....	22	5	9	4	3	7	5	6	1	4	0	0	3	4	1	3
November.....	34	8	18	9	3	7	5	6	1	4	0	0	6	9	1	3
December.....	41	9	24	12	2	5	3	4	6	22	0	0	4	6	2	7
4th Quarter	97	22	51	26	8	20	13	16	8	30	0	0	13	19	4	14
Total.....	444	100	197	100	41	100	80	100	27	100	2	100	68	100	29	100

Maternal and Child Health Survey 1962
Number of Deaths from Selected Causes in Cohort Dying in each Calendar Month

Cause of Death	All Months	January	February	March	April	May	June	July	August	September	October	November	December
Respiratory diseases	197	21	22	9	15	11	14	16	20	18	9	18	24
Gastro-intestinal diseases	41	4	2	2	5	3	3	5	5	4	3	3	2
Immaturity.....	80	5	7	8	7	10	6	6	6	12	5	5	3
Accidents.....	27	2	4	1	5	0	3	0	3	1	1	1	6
Preventable infectious diseases ..	2	0	0	0	1	0	0	0	1	0	0	0	0
Other specified causes.....	68	6	8	11	6	3	7	6	5	3	3	6	4
Cause not specified	29	3	4	3	4	2	2	4	2	1	1	1	2
Cohort dying.....	444	41	47	34	43	29	35	37	42	39	22	34	41

Percentage Distribution of Deaths from Selected Causes in Cohort Dying
in each Calendar Month

Cause of Death	All Months	January	February	March	April	May	June	July	August	September	October	November	December
Respiratory diseases.....	44	51	47	26	35	38	40	43	48	46	41	53	59
Gastro-intestinal diseases	9	10	4	6	12	10	9	14	12	10	14	9	5
Immaturity	18	12	15	24	16	34	17	16	14	31	23	15	7
Accidents.....	6	5	9	3	12	0	9	0	7	3	4	3	15
Preventable infectious diseases...	1	0	0	0	2	0	0	0	2	0	0	0	0
Other specified causes	15	15	17	32	14	10	20	16	12	8	14	18	10
Cause not specified	7	7	9	9	9	7	6	11	5	3	4	3	5
Total.....	100	100	100	100	100	100	100	100	100	100	100	100	100

Maternal and Child Health Survey 1962
Specific Mortality Rates for Selected Causes of Death by Calendar Month of Birth

Calendar Month of Birth	Number of Children at risk	All Causes of Death		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable infectious diseases		Other specified causes		Cause of Death unspecified	
		Number of deaths	Death Rate per 1000 living	Number of deaths	Death Rate per 1000 living	Number of deaths	Death Rate per 1000 living	Number of deaths	Death Rate per 1000 living	Number of deaths	Death Rate per 1000 living	Number of deaths	Death Rate per 1000 living	Number of deaths	Death Rate per 1000 living	Number of deaths	Death Rate per 1000 living
January	504	43	85	19	38	6	12	5	10	1	2	0	0	7	14	5	10
February.....	468	43	92	18	38	3	6	7	15	5	11	0	0	4	9	6	13
March.....	520	48	92	17	33	6	12	7	13	1	2	1	2	13	25	3	6
1st Quarter.	1,492	134	90	54	36	15	10	19	13	7	5	1	1	24	16	14	9
April	476	34	71	20	42	3	6	6	13	2	4	0	0	3	6	0	0
May.....	485	34	70	13	27	1	2	10	21	3	6	0	0	4	8	3	6
June.....	507	38	75	15	30	3	6	8	16	2	4	1	2	6	12	3	6
2nd Quarter.....	1,468	106	72	48	33	7	5	24	16	7	5	1	1	13	9	6	4
July	467	43	92	19	40	3	6	7	15	2	4	0	0	8	17	4	9
August.....	482	33	68	21	44	2	4	8	16	1	2	0	0	1	2	0	0
September	415	36	87	13	31	4	9	11	26	2	5	0	0	5	12	1	2
3rd Quarter	1,364	112	82	53	39	9	7	26	19	5	4	0	0	14	10	5	4
October.	419	31	74	15	36	4	9	5	12	3	7	0	0	3	7	1	2
November.....	389	37	95	17	44	3	8	3	8	3	8	0	0	9	23	2	5
December	376	23	61	10	27	3	8	3	8	2	5	0	0	4	11	1	3
4th Quarter	1,184	91	77	42	35	10	8	11	9	8	7	0	0	16	14	4	3
Unknown	44	1	23	0	0	0	0	0	0	0	0	0	0	1	23	0	0
Total.....	5,552	444	80	197	35	41	7	80	14	27	5	2	0	68	12	29	5

Maternal and Child Health Survey 1962
Percentage Distribution of Deaths from Selected Causes by Calendar Month of Birth

Calendar Month of Birth	All Causes		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable infectious diseases		Other specified causes		Cause of death not specified	
	Number of deaths	Percent- age distri- bution of causes	Number of deaths	Percent- age distri- bution of causes	Number of deaths	Percent- age distri- bution of causes	Number of deaths	Percent- age distri- bution of causes	Number of deaths	Percent- age distri- bution of causes	Number of deaths	Percent- age distri- bution of causes	Number of deaths	Percent- age distri- bution of causes	Number of deaths	Percent- age distri- bution of causes
January	43	10	19	10	6	15	5	6	1	4	0	0	7	10	5	17
February	43	10	18	9	3	7	7	9	5	19	0	0	4	6	6	21
March	48	11	17	9	6	15	7	9	1	4	1	50	13	19	3	10
1st Quarter	134	30	54	27	15	37	19	24	7	26	1	50	24	35	14	48
April	34	8	20	10	3	7	6	8	2	7	0	0	3	4	0	0
May	34	8	13	7	1	2	10	13	3	11	0	0	4	6	3	10
June	38	9	15	8	3	7	8	10	2	7	1	50	6	9	3	10
2nd Quarter	106	24	48	24	7	17	24	30	7	26	1	50	13	19	6	21
July	43	10	19	10	3	7	7	9	2	7	0	0	8	12	4	14
August	33	7	21	11	2	5	8	10	1	4	0	0	1	2	0	0
September	36	8	13	7	4	10	11	14	2	7	0	0	5	7	1	3
3rd Quarter	112	25	53	27	9	22	26	33	5	19	0	0	14	21	5	17
October	31	7	15	8	4	10	5	6	3	11	0	0	3	4	1	3
November	37	8	17	9	3	7	3	4	3	11	0	0	9	13	2	7
December	23	5	10	5	3	7	3	4	2	7	0	0	4	6	1	3
4th Quarter	91	20	42	21	10	24	11	14	8	29	0	0	16	24	4	14
Unknown	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Total	444	100	197	100	41	100	80	100	27	100	2	100	68	100	29	100

Maternal and Child Health Survey 1962
Deaths from Selected Causes by Duration of Pregnancy Numbers

Causes of Death	Total Mortality	Duration of Pregnancy				
		Under 7 mths.	7 under 8 mths.	9 under 10 mths.	9 under 10 mths.	10 mths. or more
Respiratory Diseases	197	4	5	14	172	2
Gastro-intestinal diseases	41	0	0	3	38	0
Immaturity	80	32	22	11	15	0
Accidents	27	0	0	1	26	0
Preventable infectious "	2	0	0	0	2	0
Other specified causes	68	0	2	3	61	2
Cause unspecified	29	0	0	0	28	1
All causes	444	36	29	32	342	5
Total		Under 7 mths.	7 under 8 mths.	8 under 9 mths.	9 under 10 mths.	10 mths. or more
Numbers at risk	5,552 (100%)	38 (1%)	72 (1%)	212 (4%)	5,125 (92%)	105 (2%)

Mortality Rates per 10,000 at Risk

Causes of death	Total	Under 7 mths.	7 under 8 mths.	8 under 9 mths.	9 under 10 mths.	10 mths. or more
Respiratory diseases	355	1,053	694	660	336	190
Gastro-intestinal diseases	74	0	0	142	74	0
Immaturity	144	8,421	3,056	519	29	0
Accidents	49	0	0	47	51	0
Preventable infectious "	4	0	0	0	4	0
Other specified causes	122	0	278	142	119	190
Cause unspecified	52	0	0	0	55	95
All causes	800	9,474	4,028	1,509	667	476

**Percentage Distribution of Deaths from Selected Causes
by Duration of Pregnancy**

Causes of death	Total	Under 7 mths.	7 under 8 mths.	8 under 9 mths.	9 under 10 mths.	10 mths. or more
Respiratory diseases	100	2	3	7	87	1
Gastro-intestinal diseases	100	0	0	7	93	0
Immaturity	100	40	28	14	18	0
Accidents	100	0	0	4	96	0
Preventable infectious "	100	0	0	0	100	0
Other specified causes	100	0	3	4	90	1
Cause unspecified	100	0	0	0	97	3
All causes	100	8	7	7	77	1

**Percentage Distribution Of Deaths from Selected Causes in each Cohort
Dying by duration of pregnancy**

Causes of death	Total	Under 7 mths.	7 under 8 mths.	8 under 9 mths.	9 under 10 mths.	10 mths. or more
Respiratory diseases	44	11	17	44	50	40
Gastro-intestinal diseases	9	0	0	9	11	0
Immaturity	18	89	76	34	4	0
Accidents	6	0	0	3	8	0
Preventable infectious "	1	0	0	0	1	0
Other specified causes	15	0	7	9	18	40
Cause unspecified	7	0	0	0	8	20
All causes	100	100	100	100	100	100

Maternal and Child Health Survey 1962

Specific Mortality Rates for Selected Causes of Death by Birth Weight

Weight at Birth	Number of children at risk	All Causes		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable infectious diseases		Other and unspecified causes of death	
		Number of deaths	Death Rate per 10,000 at risk	Number of deaths	Death Rate per 10,000 at risk	Number of deaths	Death Rate per 10,000 at risk	Number of deaths	Death Rate per 10,000 at risk	Number of deaths	Death Rate per 10,000 at risk	Number of deaths	Death Rate per 10,000 at risk	Number of deaths	Death Rate per 10,000 at risk
Under 3 lbs.	37	34	9,189	0	0	0	0	34	9,189	0	0	0	0	0	0
3 but under 4 lbs.	59	29	4,915	5	847	1	169	20	3,390	0	0	0	0	3	508
4 " " 5 "	147	33	2,245	18	1,224	0	0	11	748	0	0	0	0	4	272
5 " " 6 "	352	58	1,648	30	852	3	85	6	170	5	142	0	0	14	398
6 " " 7 "	1,095	92	840	43	393	13	119	3	27	6	55	1	9	26	237
7 " " 8 "	1,868	117	626	58	310	9	48	3	16	11	59	1	5	35	187
8 " " 9 "	1,322	58	439	30	227	10	76	2	15	5	38	0	0	11	83
9 " " 10 "	507	15	296	11	217	3	59	1	20	0	0	0	0	0	0
10 lbs or more	165	8	485	2	121	2	121	0	0	0	0	0	0	4	242
All weights	5,552	444	800	197	355	41	74	80	144	27	49	2	4	97	175

Percentage Distributions of Deaths

Weight at Birth	Percent-age distribution of children at risk	All Causes		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable infectious diseases		Distri-bution of deaths by weights	Distri-bution of deaths by cause
		Distri-bution of deaths by weights	Distri-bution of deaths by cause	Distri-bution of deaths by weights	Distri-bution of deaths by cause	Distri-bution of deaths by cause	Distri-bution of deaths by cause	Distri-bution of deaths by weights	Distri-bution of deaths by cause	Distri-bution of deaths by weights	Distri-bution of deaths by cause	Distri-bution of deaths by weights	Distri-bution of deaths by cause		
Under 3 lbs.	1	8	100	0	0	0	0	43	100	0	0	0	0	0	0
3 but under 4 lbs.	1	7	100	3	17	2	3	25	69	0	0	0	0	3	10
4 " " 5 "	3	7	100	9	54	0	0	14	33	0	0	0	0	4	12
5 " " 6 "	6	13	100	15	52	7	5	8	10	19	8	0	0	14	24
6 " " 7 "	20	21	100	22	48	32	14	4	3	22	6	50	1	27	28
7 " " 8 "	34	26	100	29	50	22	8	4	3	41	9	50	1	36	30
8 " " 9 "	24	13	100	15	52	24	17	2	3	19	9	0	0	11	19
9 " " 10 "	9	3	100	6	73	7	20	1	7	0	0	0	0	0	0
10 lbs. or more	3	2	100	1	25	5	25	0	0	0	0	0	0	4	50
All weights	100	100	100	100	44	100	9	100	18	100	6	100	1	100	22

Maternal and Child Health Survey, 1962
Specific Mortality Rates from Causes of Death by Complications at Delivery

Complications at Delivery	Number of children at risk	All Causes		Respiratory Diseases		Gastro-intestinal Diseases		Immaturity		Accidents		Preventable infectious diseases		Other and unspecified causes of death	
		Number of deaths	Death rate per 1,000	Number of deaths	Death rate per 1,000	Number of deaths	Death rate per 1,000	Number of deaths	Death rate per 1,000	Number of deaths	Death rate per 1,000	Number of deaths	Death rate per 1,000	Number of deaths	Death rate per 1,000
Placenta praevia	45	13	289	4	89	0	0	6	133	0	0	0	0	3	57
Retained placenta	41	3	73	1	24	1	24	1	24	0	0	0	0	0	0
Other haemorrhage	79	2	25	0	0	1	13	0	0	1	13	0	0	0	0
Abnormal pelvis	20	1	50	1	50	0	0	0	0	0	0	0	0	0	0
Dispropt. or malposit.	50	10	200	7	140	0	0	0	0	0	0	0	0	3	60
Prolonged labour	25	1	40	0	0	0	0	1	40	0	0	0	0	0	0
Laceration	157	2	13	1	6	0	0	0	0	0	0	0	0	1	6
Other trauma	7	1	143	0	0	0	0	1	143	0	0	0	0	0	0
Other complications	101	12	119	3	30	0	0	3	30	2	20	0	0	4	40
No complications reported ..	5,027	399	79	180	36	39	8	68	14	24	5	2	4	86	17
Total	5,552	444	80	197	35	41	7	80	14	27	5	2	4	97	17

Percentage Distribution of Deaths

Complications at Delivery	Percentage distribu- tion of children at risk	All Causes		Respiratory Diseases		Gastro-intestinal Diseases		Immaturity		Accidents		Preventable Infectious diseases		Other and unspecified causes of death	
		Distr. of deaths by com- plication	Distr. of deaths by causes	Distr. of deaths by com- plication	Distr. of deaths by causes	Distr. of deaths by com- plication	Distr. of deaths by causes	Distr. of deaths by com- plication	Distr. of deaths by causes	Distr. of deaths by com- plication	Distr. of deaths by causes	Distr. of deaths by com- plication	Distr. of deaths by causes	Distr. of deaths by com- plication	Distr. of deaths by causes
Placenta praevia	1	3	100	2	31	0	0	8	46	0	0	0	0	3	23
Retained placenta	1	1	100	1	33	2	33	1	33	0	0	0	0	0	0
Other haemorrhage	1	0	100	0	0	2	50	0	0	4	50	0	0	0	0
Abnormal pelvis	0	0	100	1	100	0	0	0	0	0	0	0	0	0	0
Dispropt. or malposit.	1	2	100	3	70	0	0	0	0	0	0	0	0	3	30
Prolonged labour	0	0	100	0	0	0	0	1	100	0	0	0	0	0	0
Laceration	3	0	100	1	50	0	0	0	0	0	0	0	0	1	50
Other trauma	0	0	100	0	0	0	0	1	100	0	0	0	0	0	0
Other complications	2	3	100	2	25	0	0	4	25	7	17	0	0	4	33
No complications reported ..	91	90	100	91	45	95	10	85	17	89	6	100	1	89	22
Total	100	100	100	100	44	100	9	100	18	100	6	100	1	100	22

Maternal and Child Health Survey 1962
Specific Mortality Rates for Selected Causes of Death by Adequacy of Home Care

Quality of Home Care	Number of children at risk	All Causes		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable infectious diseases		Other & Unspecified causes of death	
		Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000
Adequate.....	2,328	75	32	38	163	7	30	4	17	9	39	1	4	16	69
Poor.....	1,756	161	92	87	495	28	159	9	51	12	68	1	6	24	137
Fair.....	65	5	77	3	462	1	154	0	0	0	0	0	0	1	154
Undetermined.....	42	3	71	2	476	0	0	0	0	0	0	0	0	1	238
Total reported.....	4,191	244	58	130	310	36	86	13	31	21	50	2	5	42	100
Not reported.....	1,361	200	147	67	492	5	37	67	492	6	44	0	0	55	404
Grand total.....	5,552	444	80	197	355	41	74	80	144	27	49	2	4	97	175

Percentage Distribution of Deaths

Quality of Home Care	Percent-age distribution of children at risk	All Causes		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		Preventable infectious diseases		Other & Unspecified causes of death	
		Distribution by quality of care	Distribution by cause	Distribution by quality of care	Distribution by cause	Distribution by quality of care	Distribution by cause	Distribution by quality of care	Distribution by cause	Distribution by quality of care	Distribution by cause	Distribution by quality of care	Distribution by cause	Distribution by quality of care	Distribution by cause
Adequate.....	42	17	100	19	51	17	9	5	5	33	12	50	1	16	21
Poor.....	31	36	100	44	54	68	17	11	6	44	7	50	1	25	15
Fair.....	1	1	100	2	60	2	20	0	0	0	0	0	0	1	20
Undetermined.....	1	1	100	1	67	0	0	0	0	0	0	0	0	1	33
Total reported.....	75	55	100	66	53	88	15	16	5	78	9	100	1	43	17
Not reported.....	25	45	100	34	34	12	2	84	34	22	3	0	0	57	27
Grand total.....	100	100	100	100	44	100	9	100	18	100	6	100	0	100	22

Maternal and Child Health Survey 1962
Specific Mortality Rates for Selected Causes of Death by Factors adversely affecting Home Care

Factors adversely affecting Home Care	Number of children at risk	All Causes of death		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		All Other Causes of Death	
		Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000
Abuse of Alcohol	554	46	830	30	541	7	126	4	72	1	18	4	72
Overcrowding.	986	81	822	49	497	10	101	4	41	7	71	11	112
Poor housing	949	86	906	47	495	19	200	4	42	8	84	9	95
Poor sanitation	1,018	96	943	57	560	19	187	4	39	7	69	9	88
Unsafe water	415	40	964	20	482	11	265	1	24	1	24	7	169
Insufficient water	402	21	522	15	373	4	100	1	25	1	25	0	0
Parental apathy	634	64	1,009	38	599	12	189	4	63	4	63	6	95
Maternal ill health	141	12	851	6	426	1	71	2	141	1	71	2	141
Other illness in home	115	8	696	5	435	1	87	0	0	0	0	2	173
Improper use of means	608	59	970	30	493	12	197	4	66	6	99	7	115
Other adverse factors	323	27	836	13	402	4	124	5	155	2	62	3	93
Total affected	1,835	163	888	89	485	28	153	9	49	12	65	25	136
No adverse factors reported	3,717	281	756	108	291	13	35	71	191	15	40	74	199
Grand total	5,552	444	800	197	355	41	74	80	144	27	49	99	178

Maternal and Child Health Survey 1962
Percentage Distribution of Deaths from Selected Causes by Factors adversely affecting Home Care

Factors adversely affecting Home Care	Percentage distribution of children at risk	All Causes of Death		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		All Other causes of death	
		Distribution by adverse factor	Distribution by cause	Distribution by adverse factor	Distribution by cause	Distribution by adverse factor	Distribution by cause	Distribution by adverse factor	Distribution by cause	Distribution by adverse factor	Distribution by cause	Distribution by adverse factor	Distribution by cause
Abuse of Alcohol	10	10	100	15	65	17	15	5	9	4	2	4	9
Overcrowding.....	18	18	100	25	60	24	12	5	5	26	9	11	14
Poor housing	17	19	100	24	55	46	22	5	5	30	9	9	10
Poor sanitation	18	22	100	29	59	46	20	5	4	26	7	9	9
Unsafe water	7	9	100	10	50	27	28	1	3	4	3	7	18
Insufficient water	7	5	100	8	71	10	19	1	5	4	5	0	0
Parental apathy.....	11	14	100	19	59	29	19	5	6	15	6	6	9
Maternal ill health	3	3	100	3	50	2	8	3	17	4	8	2	17
Other illness in home.....	2	2	100	3	63	2	12	0	0	0	0	2	25
Improper use of means	11	13	100	15	51	29	20	5	7	22	10	7	12
Other adverse factors.....	6	6	100	7	48	10	15	6	19	7	7	3	11
Total affected	33	37	100	45	55	68	17	11	6	44	7	25	15
No adverse factors reported.....	67	63	100	55	38	32	5	89	25	56	5	75	26
Grand total	100	100	100	100	44	100	9	100	18	100	6	100	22

Table 50

Maternal and Child Health Survey 1962
Specific Mortality Rates for Selected Causes of Death by Duration of Breast Feeding

Duration of Breast feeding	Number of children at risk	All Causes of Death		Respiratory Diseases		Gastro-intestinal diseases		Immaturity		Accidents		All Other Causes of death	
		Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000
Under 1 month.....	1,821	132	725	74	406	10	55	10	55	9	49	29	159
1 but under 2 months.....	252	33	1,310	14	556	5	198	0	0	6	238	8	317
2 but under 3 months.....	246	17	691	12	488	1	41	0	0	3	122	1	41
Subtotal under 3 months.....	2,319	182	785	100	431	16	69	10	43	18	78	38	164
3 but under 4 months.....	185	15	811	6	324	1	54	0	0	1	54	7	378
4 but under 5 months.....	134	7	522	7	522	0	0	0	0	0	0	0	0
5 but under 6 months.....	210	9	429	5	238	2	95	0	0	1	48	1	48
6 but under 7 months.....	67	2	299	1	149	0	0	0	0	0	0	1	149
7 months or more.....	937	15	160	10	107	5	53	0	0	0	0	0	0
Subtotal over 3 months.....	1,533	48	313	29	189	8	52	0	0	2	13	9	59
Subtotal breast fed.....	3,852	230	597	129	335	24	62	10	26	20	52	47	122
No record of breast feeding.....	1,700	214	1,259	68	400	17	100	70	412	7	41	52	306
Total.....	5,552	444	800	197	355	41	74	80	144	27	49	99	178

Percentage Distribution of Deaths from Selected Causes of Death by Duration of Breast Feeding

Duration of Breast Feeding	Percentage distribution of children at risk	Distribution by duration of breast feeding		Distribution by cause	Distribution by duration of breast feeding		Distribution by cause	Distribution by duration of breast feeding		Distribution by cause	Distribution by duration of breast feeding		Distribution by cause	Distribution by duration of breast feeding		Distribution by cause
		Distribution by duration of breast feeding	Distribution by cause		Distribution by duration of breast feeding	Distribution by cause		Distribution by duration of breast feeding	Distribution by cause		Distribution by duration of breast feeding	Distribution by cause		Distribution by duration of breast feeding	Distribution by cause	
Under 1 month	33	30	100	38	56	24	8	13	8	33	7	29	22			
1 but under 2 months.....	5	7	100	7	42	12	15	0	0	22	18	8	24			
2 " 3 "	4	4	100	6	71	2	5	0	0	11	18	1	5			
Subtotal under 3 months.....	42	41	100	51	55	39	9	13	5	67	10	38	21			
3 but under 4 months.....	3	3	100	3	40	2	7	0	0	4	7	7	47			
4 " 5 "	2	2	100	4	100	0	0	0	0	0	0	0	0			
5 " 6 "	4	2	100	2	56	5	22	0	0	4	11	1	11			
6 " 7 "	1	1	100	1	50	0	0	0	0	0	0	1	50			
7 months or more.....	17	3	100	5	67	12	33	0	0	0	0	0	0			
Subtotal over 3 months.....	28	11	100	15	60	20	17	0	0	7	4	9	19			
Subtotal breast fed	69	52	100	65	56	59	10	13	4	74	9	47	20			
No record of breast-feeding.....	31	48	100	35	32	41	8	88	33	26	3	53	24			
Total.....	100	100	100	100	44	100	9	100	18	100	6	100	22			

Maternal and Child Health Survey, 1962

Specific Mortality Rates for Selected Causes of Death by Nursing Supervision of Bottle Feeding

Supervision of bottle feeding	Number of Children at risk	All causes of death		Respiratory Diseases		Gastrointestinal Diseases		Immaturity		Accidents		All other causes of death	
		Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000
Reported as not supervised.....	663	34	513	22	332	5	75	1	15	0	0	0	90
Supervision of feeding not reported.....	1,123	270	2,404	88	784	12	107	77	686	20	178	73	650
Subtotal (?) unsupervised	1,786	304	1,702	110	616	17	95	78	437	20	112	79	442
Feeding reported supervised.....	2,762	123	445	76	275	19	69	2	7	7	25	19	69
Total bottle fed.....	4,548	427	939	186	409	36	79	80	176	27	59	98	215
Reported as breast fed for six months or more.....	1,104	17	169	11	110	5	50	0	0	0	0	1	10
Grand total.....	5,552	444*	800	197	355	41	74	80	144	27	49	99	178

Percentage Distribution of Deaths from Selected Causes by Nursing Supervision of Bottle Feeding

Supervision of bottle feeding	Percentage Distr. of Children at risk	All causes of death		Respiratory Diseases		Gastrointestinal Diseases		Immaturity		Accidents		All other causes of death	
		Distr. by nature of supervision	Distr. by cause	Distr. by nature of supervision	Distr. by cause	Distr. by nature of supervision	Distr. by cause	Distr. by nature of supervision	Distr. by cause	Distr. by nature of supervision	Distr. by cause	Distr. by nature of supervision	Distr. by cause
Reported as not supervised.....	12	7	100	11	65	12	15	1	3	0	0	6	18
Supervision of feeding not reported.....	20	61	100	45	33	29	4	96	29	74	7	74	27
Subtotal (?) unsupervised	32	68	100	56	36	41	6	98	26	74	7	80	26
Feeding reported supervised	50	28	100	39	62	46	15	2	2	26	6	19	15
Total bottle fed.....	82	96	100	94	44	88	8	100	19	100	6	99	23
Reported as breast fed for six months or more.....	18	4	100	6	65	12	29	0	0	0	0	1	6
Grand total.....	100	100	100	100	44	100	9	100	18	100	6	100	22

Maternal and Child Health Survey, 1962

Specific Mortality Rates for Selected Causes of Death by Quality and Quantity of Food at Weaning (positive reports only)

Quality	Quantity	Number of Children at risk	All causes of death		Respiratory Diseases		Gastrointestinal Diseases		Immaturity		Accidents		All other causes of death	
			Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000	Number of deaths	Death rate per 10,000
Good	Sufficient	2,735	62	227	33	121	5	18	1	4	8	29	15	55
	Insufficient	228	2	88	2	88	0	0	0	0	0	0	0	0
	Unknown	88	3	341	3	341	0	0	0	0	0	0	0	0
	Subtotal	3,051	67	220	38	125	5	16	1	3	8	26	15	50
Poor	Sufficient	136	3	221	3	221	0	0	0	0	0	0	0	0
	Insufficient	610	39	639	23	377	8	131	0	0	1	16	7	115
	Unknown	11	1	909	0	0	0	0	0	0	0	0	1	909
	Subtotal	757	43	568	26	343	8	106	0	0	1	13	8	106
Uncertain	Unknown	77	6	779	4	519	0	0	0	0	0	0	2	260
Total		3,885	116	299	68	175	13	33	1	3	9	23	25	64

Percentage Distribution of Deaths from Selected Causes by Quality and Quantity of Weaning Diet

Quality	Quantity	Percentage Distr. of Children at risk	All causes of death		Respiratory Diseases		Gastrointestinal Diseases		Immaturity		Accidents		All other causes of death	
			Distr. by quality - quantity	Distr. by quantity	Distr. by quality - quantity	Distr. by cause	Distr. by quality - quantity	Distr. by cause	Distr. by quality - quantity	Distr. by cause	Distr. by quality - quantity	Distr. by cause	Distr. by quality - quantity	Distr. by cause
Good	Sufficient	70	53	100	49	53	38	8	100	2	89	13	60	24
	Insufficient	6	2	100	3	100	0	0	0	0	0	0	0	0
	Unknown	2	3	100	4	100	0	0	0	0	0	0	0	0
	Subtotal	78	58	100	56	57	38	7	100	1	89	12	60	22
Poor	Sufficient	4	3	100	4	100	0	0	0	0	0	0	0	0
	Insufficient	16	33	100	34	59	62	21	0	0	11	3	28	18
	Unknown	0	1	100	0	0	0	0	0	0	0	0	4	100
	Subtotal	20	37	100	38	60	62	19	0	0	11	2	32	19
Total	Unknown	2	5	100	6	67	0	0	0	0	0	0	8	33
		100	100	100	100	59	100	11	100	1	100	8	100	22

THE IMMUNISATION PROGRAMMES

The original computer analysis of the coverage achieved in the immunisation programmes was made on the basis of total births and showed such a low level of success as to arouse consternation. It was realised however that this did not afford a fair basis for assessment in view of the heavy mortality occurring during the first five months of life. Many children did not live to be old enough to be eligible to be immunised. The table was therefore re-calculated on the basis of the number of children who survived their fifth month of life. On this basis, a 70% successful coverage was achieved but only 38% of the child population at risk was completely covered i. e. in only that small proportion of the infants was the full course of injections given. At least 30% of the infants at risk escaped all immunisation efforts. Despite the fact that only 2 deaths were reported from diseases preventable by these procedures, this is not a satisfactory level of achievement. Of course, many of the partially immunised may have had their immunisation completed during the period subsequent to the period of study but failure to include 30% of the children still left a large number of children vulnerable. All these children were followed until they were twelve months old. Over 5000 survived their first year of life and of these only 2000 were reported as completely immunised against Diphtheria, Pertussis, Tetanus and Poliomyelitis, only 40%. Approximately another 1666 were partially immunised, another 33% or a total coverage of only 73% of those who survived to be one year old. Incidentally this finding again indicates that, in 1962, Medical Services programmes were effectively reaching only less than three quarters of the Indians included under these programmes. This population itself constitutes only less than three quarters of the registered Indian population.

A special word must be said regarding smallpox vaccination. Admittedly endemic smallpox has been eradicated in Canada for nearly a generation but the anti-smallpox vaccination campaign has not been abandoned. In 1962 infants were all supposed to have been vaccinated during the first month of their lives, subsequent modifications in the programme were introduced some years later. On the data reported, this programme was either very poorly carried out or very badly reported. Only 25% of the infants born in 1962 were vaccinated before they were a year old. With this futile level of protection, the vaccination of Indian infants might very well be postponed until the second year of life, as advised by the British Health Authorities, or abandoned altogether without added risk. If infant vaccination is to be continued as a serious public health preventive measure, it is sincerely to be hoped that a much higher level of protection can be achieved.' In the case of smallpox, to vaccinate only a quarter of the population at risk is simply not worth the effort. Incidentally, various attempts made recently to estimate the level of immunity to smallpox in the Canadian population in general indicate that, in most random samples, not 20% of Canadians have any measurable level of protective antibodies. The country as a whole is therefore extremely vulnerable to invasion by this disease in spite of the nation-wide advocacy of mass infant vaccination.

On the basis of research work done in the United Kingdom on diphtheria immunisation over twenty years ago, it was found that when 80% of a population at risk were effectively immunised only a few sporadic cases would occur and epidemic spread was effectively checked. This figure of 80% has since become the standard level of immunity to be achieved in immunising a vulnerable population and a "herd immunity of 80%" has become almost a magic formula by which to measure 100% success of an immunisation programme. On the data reported for Indian infants in 1962, with only 2 deaths reported due to diseases preventable by the current programmes, it would seem that a 70% herd immunity, only 40% fully immunised, was equally effective. Nevertheless one

Maternal and Child Health Survey 1962
Medical Services Immunisation Programme Coverage

Immunised against	Population at risk	Numbers				Percentage of Population at risk			
		Immunised			Not immunised	Immunised			Not immunised
		Total	Completely	Partially		Total	Completely	Partially	
Smallpox	Living during 1st month of life	1368	1349	19	4032	25	25	0.4	75
Diphtheria	Surviving to 6th month of life	3692	2012	1680	1538	71	38	32	29
Pertussis	Surviving to 6th month of life	3669	2000	1669	1561	70	38	32	30
Tetanus	Surviving to 6th month of life	3664	2000	1664	1566	70	38	32	30
Poliomyelitis	Surviving to 6th month of life	3636	1984	1652	1594	70	38	32	30

* "Unsuccessfully" i.e. no primary "take"

hesitates to advocate this level of herd immunity as satisfactory or safe. This level of protection might not have been so "successful" had the population been concentrated in one city instead of being widely dispersed in small groups over the vastness of Canada.

"PREMATURITY" AND "OVERTERM"

Prematurity rate by duration of pregnancy

The standard for measuring prematurity by duration of pregnancy most generally accepted amongst obstetricians is a gestation period of under 37 weeks. In this study, duration of pregnancy was not recorded in weeks so no direct comparison can be made with national figures. However, 37 weeks is a period between 8 and 9 "months", as recorded in this study so that, to include all periods of gestation recorded as "under 9 months" as "premature" is fully justified. It was shown previously that the infant mortality amongst all children said to have been born with less than 9 months gestation was dramatically higher than amongst those with 9 or more months gestation, the respective infant mortality rates being 301 per 1000 live births for infants born under 9 months gestation and 66 per 1000 live births for those born with 9 months or more gestation. If, then, all children born with less than 9 months gestation, as reported, were in fact "premature", the prematurity rate among Indian births in 1962 was 61.09 per 1000 births or just over 6%. The prematurity rate among Canadian births as a whole appears to be around 8% of all live births. It is highly improbable that the Indian rate would be much less and it could reasonably be expected to be higher. The data on duration of pregnancy does not, however, substantiate this hypothesis. Individual nurses have reported that a surprisingly large number of Indian mothers claim to have gone to 10 months or more. It is not very likely that so many Indian mothers really have such prolonged gestation periods and it is most likely that they tend to overestimate the duration of their pregnancy. If so it is quite probable that a considerable number of the so-called full term pregnancies were in fact less than 9 months in duration and the prematurity rate much higher than 6%.

Prematurity rate by birth weight

The accepted standard for estimating prematurity by birth weight is weights of $5\frac{1}{2}$ lbs or less. Unfortunately, in this study, weights at birth were reported in full pounds so that the number of children who weighed $5\frac{1}{2}$ lbs or less at birth among those reported as being "over 5 lbs but under 6 lbs" at birth cannot be accurately estimated. The infant mortality amongst children born weighing less than 6 lbs was 259 per 1000 live births compared with 59 per 1000 live births for those born weighing 6 lbs or more, suggesting that to regard all infants weighing less than 6 lbs at birth as "premature" might be justifiable. On this basis, 10.82% of all Indian births in 1962 were premature. However, it was noted previously that a high percentage of even allegedly "overterm" children were born with unduly low birth weights and that there is a tendency for Indian infants, though otherwise "normal", to be rather small. To base an estimation of prematurity on all weights under 6 lbs would therefore probably be an overestimation. To arrive at a possibly more accurate estimate, it was assumed that half the children weighing over 5 lbs but under 6 lbs weighed $5\frac{1}{2}$ lbs or less. On this basis, the prematurity rate works out at 76.81 per 1000 total births or 75.65 per 1000 born alive, or almost 8% of all births, a rate approximating much more closely to the national rate. This estimation is probably low and the true prematurity rate most likely lies between the two estimations which would suggest that prematurity amongst Indians is either at virtually the same rate as amongst Canadians as a whole or possibly a little higher. It could be as high as 10% but only a more precise study can determine this.

Incidence of "overterm" and "overweight" infants

The data on duration of pregnancy suggests that 6% of Indian infants were premature and 2% were overterm (10 months or more). The data on birth weights suggests that between 8 to 11% of Indian infants were premature but 12% were "overweight" (9 lbs or more) at birth. In view of the fact that overweight babies are commonly born to diabetic or incipiently diabetic mothers, this high proportion of heavy infants among Indians is worthy of closer investigation. The age break down, to be discussed in greater detail subsequently, suggests that the majority of these heavy infants were born to the older mothers who would also be more liable to incipient diabetes.

Comparison of duration of pregnancy in selected categories of mothers

The table of comparison based on duration of pregnancy indicates that unmarried mothers tended to have a slightly higher prematurity rate than married women or women in a stable relationship, for the time being at least, with one man, and a lower rate of "overterm" babies. There was no difference in regard to the incidence of "normal" pregnancies. There was an increasing tendency for pregnancy to terminate earlier as age advanced and, on the other hand, to be more prolonged, with the result that the incidence of "normal" pregnancies tended to decrease as age advanced. This should be compared with the similar comparison made on birth weights. The same features are evident in relation to increasing birth rank. The higher the birth rank, the greater the incidence of both shorter and longer pregnancies and the less likely is the pregnancy to be "normal". Mothers with adequate diets had markedly fewer early terminations, more prolonged gestation than mothers on inadequate diets and a significantly greater number of "normal" pregnancies. Mothers whose diets were supplemented showed a significantly greater number of normal pregnancies and a very markedly lower prematurity rate than those whose diets were not. The number of long term pregnancies was not apparently affected to anything like the same degree, the rates in both groups not differing significantly, in fact being almost the same. Pre-natal supervision made a marked difference in the prematurity rate, reducing it from 73 per 1000 births in the unsupervised group to between 51 or 52 in the supervised group. It was also associated with an increased tendency to so-called long pregnancies. It is obvious from this table and subsequent tables that the group supervised by the nurses was practically identical with that supervised by physicians with only a few additional mothers who did not also see a physician. Pre-natal supervision, however, reached only 54% of mothers. This is altogether too low a proportion.

Comparison of birth weights in selected categories of mothers

As in the previous table, the prematurity rate among children born to unmarried mothers not living in stable union with the father of their child, was significantly higher than among the "married" group. Married women also had a much higher rate of overweight babies. The rate for babies of "normal" or "average" weight was higher among the unmarried mothers because fewer children were born to this group weighing 9 lbs or more.

The influence of age is very clearly demonstrated. As the age of the mother increased the ratio of babies of average weight born to them steadily and significantly declined while both the "prematurity rate" and the "overweight rate" rapidly increased, the "overweight rate" much more significantly. The more elderly the mother, the bigger her baby would seem likely to be and therefore the more difficult to deliver. At the same time, the more liable would she be to earlier termination of the pregnancy, as shown in the previous table, with the risk of an under-weight child being born prematurely.

The same feature is reflected in the data on birth rank, as might be expected, but not nearly so consistently or definitely, which would suggest that this trend at least in regard to heavy infants, is a function more of age per se than of repeated pregnancies per se. The possible association with diabetes should not be overlooked.

In this table it was possible to study the effect of the season of year in which birth occurred. The prematurity rate, as calculated, was not greatly influenced save that it was a little higher among babies born in the winter and lower among those born in the spring. The ratio of overweight babies was somewhat higher amongst children born in the spring and summer. The effect of the season of birth on the incidence of specific birth weights was more interesting and will be discussed later. The proportion of babies of "normal" or "average" weight at birth was highest among those born in the spring but there was no really significant difference.

The adequacy of the maternal diet made a very significant difference. The prematurity rate among mothers on adequate diets was 84 per 1000 births as compared with 170 per 1000 births among children born to mothers on inadequate diets, the rate for children of "normal" weight was 787 per 1000 births as against 752 per 1000 among children born to the poorly nourished and the rate for the overweight babies was 129 per 1000 born to the well nourished but only 78 per 1000 among the poorly nourished.

The effect of supplementing the diet was to reduce the rate of under-weight children born from 193 per 1000 among mothers whose diets were not supplemented to 91 per 1000 births among mothers who did have supplements supplied and to increase the rate of overweight babies from 109 per 1000 born to mothers on unsupplemented diets to 124 per 1000 born to mothers whose diets were supplemented. The rate of births of average weight increased from 699 per 1000 to 785 per 1000 among mothers on supplemented diets.

The effect of adequate pre-natal supervision was equally dramatic. Amongst mothers who were not supervised during their pregnancies by a physician or a nurse, the prematurity rate was 129 per 1000 births as against 94 or 91 in the supervised group. The unsupervised group unfortunately comprised 46% of all mothers. The incidence of normal birth weights increased from 754 per 1000 born to unsupervised mothers to 784 among nurse-supervised mothers and the incidence of overweight infants increased from 117 per 1000 in the unsupervised group to 128 among physician-supervised mothers.

Marriage status and specific birth weights

Unmarried mothers tended to give birth to a greater proportion of very small babies. This group comprised 22% of all mothers but they gave birth to 25% of the infants under 3 lbs weight at birth and 26% of those under 4 lbs at birth. Women living in common law relationship also showed a remarkably high incidence of very small infants but this group comprised only 110 mothers or some 2% of all mothers so that rates are liable to wide fluctuation. However this 2% of mothers produced 10% of the children under 3 lbs weight at birth. The 74% of the mothers legally married produced only 65% of the infants under 3 lbs, 69% of those under 4 lbs but 83% of those weighing 10 lbs or more at birth, in sharp contrast to the 22% of mothers living without benefit of "husband" who bore only 14% of the heavy weight babies. Amongst Indian infants born in 1962, 33.6% weighed between 7 and 8 lbs at birth. Among unmarried mothers, who would include a very large proportion of younger women, 35.4% of their babies were of these weights while exactly one third of babies born to legally married women weighed between 7 and 8 lbs at birth.

Age of mother and birth weights

Very young mothers, aged 15 and 16, tended to have a high rate of very small babies but also the highest rate of babies of normal weight, not many very large babies. Among teenage mothers as a whole, the incidence rate of the birth of infants weighing 7 to 8 lbs was 392 per 1000 born, amongst mothers aged 20 years it was 399 per 1000 born. The incidence of this birth weight drops quite steadily as age advances. For mothers aged under 15, the incidence of this birth weight was 375 per 1000, for mothers aged 15-19, it was 392, as stated, for mothers aged 20-24 it dropped to 363, for mothers aged 25-29 it was 335, among mothers aged 30-34 it was 299, for mothers aged 35-39 it was 297, for mothers between 40-44 it was 258 and for mothers over 45 years it was 213 per 1000 born. In contrast, the incidence rate of births of infants weighing 10 lbs or more at birth rises as age advances. There were no children of that weight born to girls under 15. The rate for teenage mothers as a whole was 12 per 1000 births, for mothers aged 20-24, it was 21, for the 25-29 year olds it was 25, among mothers aged 30-34 it was 49, it dropped to 43 in the 35-39 year old group, but at age 37 it was 50, at age 40 it was 70 and for mothers of 45 or more years the incidence rate of very heavy babies was 128 per 1000 born. The incidence of very small babies also increased with advancing age but not to the same extent nor with the same smooth regularity. The incidence rate for infants weighing less than 5 lbs at birth among teenage mothers was 41 per 1000 births, 40 for mothers aged 20-24, 36 for mothers aged 25-29, but rose to 58 per 1000 babies born to mothers aged 30-34 and 65 per 1000 for mothers aged 35-39. Amongst mothers aged 45 years or more the rate was 64 per 1000 births. The tendency for babies to be born heavier as age advances was much more definite and was further supported by the age specific incidence rate of infants born weighing between 9 and 10 lbs. Among teenage mothers this incidence was 53 per 1000 births, for mothers aged 20-24 it was 76, for 25-29 year old mothers, 90 for mothers aged 30-34, 102, for mothers aged 35-39, 140, for the 40-44 year old group it dropped slightly to 131 but for mothers of 45 years of age or more it was 170 per 1000 births. The rates for 6 lbs babies drops steadily with age. In the under 15 year old group this birth weight rate stood at 375 per 1000 births and dropped progressively in each five year age group to 235, 216, 198, 170, 160, 148 but rose to 213 for mothers of 45 or more. The rates for infants weighing between 5 and 6 lbs remained fairly constant at from 7 to 6% of births in each 5 year age group but reached 8.6% of births in the 40-44 year old group. The prematurity rate reached its peak among mothers aged 30-34. The younger the mother the more likely is she to have a baby weighing between 6 and 8 lbs and the older she is the more liable is she to bear a baby weighing over 8 lbs the more troublesome the labour likely to be and the greater the risk of birth injury therefore the greater her need for expert professional pre-natal supervision. The possible association between heavy babies and diabetes has also been mentioned and it might be well to pay special attention to any mother who gives birth to a very large child, especially if she is advancing in years.

Birth rank and birth weight

The number of pregnancies an Indian woman has is considerably influenced by her age so one would expect to find a similar correlation between birth rank and birth weight to that between age of mother and birth weight. As regards infants of normal or greater weight a similar association was shown but the range of differences was not so great. There was not as much similarity in the pattern of infants of low weight. There was a very sharp increase in infants weighing less than 5 lbs amongst 7th and 8th children. Whereas age seems to be the major factor to increasing the size of the child, multiparity would seem to be more important in predisposing to early termination of pregnancy and the birth of unusually small premature infants.

The season of the year of birth and birth weights

In an earlier section of this report dealing with mortality it was noted that infants born in September had a surprisingly high mortality rate, particularly from immaturity. The incidence rate for babies weighing less than 5 lbs was dramatically high amongst September babies and a greater proportion of unusually small babies were born in the fall months generally than in any other season of the year. This is masked in the first table of comparison by including all infants weighing less than 6 lbs but is clearly shown in the table showing the relative incidence rates of specific birth weights. 7% of babies born in September weighed less than 5 lbs at birth whereas only 4.4% of those born in the winter were under this weight although the "prematurity rate" given in the first table of comparison was slightly higher in the winter than in the fall. It would appear that infants conceived in the winter months run a greater risk of being born prematurely than those conceived in any other season and of being markedly underweight even if they go to full term. At the same time the September born infants also showed the highest rate of very heavy babies. These extremes of birth weight were increased at the expense of infants weighing from 5 to over 6 lbs and 8 lbs. Winter conceptions would therefore appear to have a tendency to be abnormal in both directions, tending to be either very small or very large. The incidence of very small infants was lowest in children born in the spring and summer months and the incidence of "normal" infants, i. e. those weighing between 7-8 lbs, was highest among the children born in the spring, particularly in March. These would be summer conceptions. This group comprised 27% of all births but accounted for 23% of the very small babies and 25% of the very heavy infants, whereas the 22% of all infants who were born in the fall provided 35% of the very small infants and 26% of the very heavy babies. The 26% of all births that occurred during the summer months provided only 15% of the very small premature infants and 28% of the very heavy infants. The lowest percentage of "normal" infants (7-8 lbs) were born in the fall, the greatest percentage in the spring.

Influence of adequate diet on birth weight

The incidence of births of infants weighing less than 5 lbs was 26 per 1000 births among well nourished mothers but 66 per 1000 infants born to poorly fed mothers. The incidence of the very small under 3 lbs infants was even more dramatic being 1 per 1000 among well nourished mothers and 9 per 1000 among the poorly nourished. Unfortunately the greater number of very tiny infants were born to mothers whose nutrition was reported to be "unknown" or not reported at all but the rates shown would seem to suggest the nutrition of these mothers must have left much to be desired. At the other end of the scale, well nourished mothers, who comprised 53% of all mothers, produced 52% of the babies weighing 10 lbs or more at birth while the 15% of all mothers reported to be inadequately nourished gave birth to only 8% of such children. Even this low percentage is somewhat surprising under the circumstances. The 32% of mothers whose nutrition was not assessed gave birth to three quarters of the infants weighing less than 3 lbs at birth and 40% of the heavy children. The 53% of mothers reported to be adequately nourished gave birth to 55% of the 7-8 lbs infants, the 15% reported as poorly nourished bore 14% of the 7 lb babies and the 32% of mothers whose nutrition was not assessed bore 31% of these "normal" children.

Influence on birth weight of supplementing the diet

Some 83% of all mothers supplemented their diets for some period during their pregnancy, mainly by additional food, 17% did not or were not known to have done so. The incidence of births of infants weighing less than 3 lbs at birth in the first group was 1 per 1000. The incidence in the second much smaller group was 39 per 1000 births. The respective incidence of 3-4 lbs babies were 7 and 30 per 1000 births and for 4-5 lbs

infants, 20 and 61 respectively. The incidence rate of 7-8 births was exactly the same in both groups but the incidence rate of births of infants weighing 10 lbs or more at birth was 31 per 1000 in the first group and 23 per 1000 in the second.

As in the previous study on infant mortality, the addition of capsules only had less effect than the addition of other supplements but the group using both other supplements and the pre-natal capsules showed much the greatest benefit insofar as the birth of very small babies and babies of normal birth weight were concerned. Caution has to be exercised in interpreting the rates, however, as in some instances the numbers on which they are based are extremely small. For example, 11 infants born to mothers taking capsules only who weighed less than 5 lbs at birth gave a "prematurity rate" of 58 per 1000 births while 82 such children born to mothers taking other supplements only give a rate of 35 per 1000 and 37 such infants born to mothers taking both capsules and other supplements give a rate of 17 per 1000. Among the group not known to have supplemented their diets, 123 infants were born weighing less than 5 lbs and the corresponding "prematurity rate" was 130 per 1000 born. The trend indicated is perhaps valid but the rates are subject to too great erratic fluctuation to have much significance in themselves as quantitative values.

Influence on birth weight of pre-natal supervision

The breakdown in this study reveals quite clearly that the cohort of mothers supervised by physicians was almost identical with that supervised by nurses. In some categories the numbers are identical, in others extremely close. It is obvious that the nurses did not claim to have supervised the pregnancies of many more mothers than they referred to the physicians. Perhaps the questionnaire was misunderstood. Nurses were believed to be giving pre-natal supervision to a great many more mothers than could be supervised by the physicians. Either this belief was unfounded or the nurses sold themselves short in reporting their own supervising activities. In either case the record shows that pre-natal supervision was given to only a little over half of all Indian mothers. With this poor level of pre-natal coverage, it is not surprising that the infant mortality should still be so high.

Where supervision was given, however, the effect was very clearly beneficial. The incidence of birth weights of 7-8 lbs rose from 32% in the unsupervised group to 35% in the supervised group, the incidence of birth weights of under 5 lbs fell from 6% in the unsupervised group to 3% in the supervised group. There was no significant change in the relative incidence of the birth of very heavy infants.

Not unreasonably the greatest benefit on the premature birth rate was shown amongst mothers who had extended periods of supervision and particularly if it included the last trimester. Much less benefit was derived by mothers who dropped out during the last three months of their pregnancy and the least benefit was derived by mothers who were supervised during only the first three months of pregnancy. The actual rates shown are, of course, subject to the same caution in interpretation as indicated before in relation to the study on supplementing the diets. The nurses reported more success in keeping a greater number of women under supervision during the 2nd and 3rd trimesters than was ascribed to the physicians and this is reflected in a greater reduction in the incidence of birth weights of less than 5 lbs in this group of well supervised mothers, only 2% of the births as against 4% of the births to mothers supervised by physicians for the same period. The majority of women supervised by physicians were seen only during the last three months of pregnancy.

Maternal and Child Health Survey 1962
Comparison between Incidence of "Premature", "Normal" and "Overterm" Pregnancies
in certain selected categories of mothers

Selected Categories	Number of Births			"Overterm" 10 or more mths. pregnancy	Percentage Distribution by selected category of mothers			Incidence Rates per 100 births			
	Total births	"Premature" under 9 mths. pregnancy	"Normal" 9-10 mths. pregnancy		Total births	"Premature" under 9 mths. pregnancy	"Normal" 9-10 mths. pregnancy	"Overterm" 10 or more mths. pregnancy	"Premature" under 9 mths. pregnancy	"Normal" 9-10 mths. pregnancy	"Overterm" 10 or more mths. pregnancy
All categories or Indian "average"	5,598	342	5,150	106	100	100	100	100	61	920	19
All "married" women (including common law)...	4,337	257	3,992	88	77	75	78	83	59	920	20
Unmarried mothers, father not in home.....	1,247	82	1,148	17	22	24	22	16	66	920	14
Mothers aged under 15 years.....	16	0	16	0	0	0	0	0	0	1,000	0
Mothers aged 15-19 years.....	729	45	670	14	13	13	13	13	62	919	19
Mothers aged 20-24 years.....	1,598	99	1,468	31	29	29	29	29	62	919	19
Mothers aged 25-29 years.....	1,347	68	1,250	29	24	20	24	27	50	928	22
Mothers aged 30-34 years.....	952	66	875	11	17	19	17	10	69	919	12
Mothers aged 35-39 years.....	644	47	580	17	12	14	11	16	73	901	26
Mothers aged 40-44 years.....	244	13	229	2	4	4	4	2	53	939	8
Mothers aged 45 or more.....	47	4	41	2	1	1	1	2	85	872	43
First births.....	807	39	747	21	14	11	15	20	48	926	26
2nd births.....	759	72	679	8	14	21	13	8	95	895	10
3rd births	635	32	593	10	11	9	12	9	50	934	16
4th births	649	28	608	13	12	8	12	12	43	937	20
5th births	588	35	543	10	11	10	11	9	60	923	17
6th births	462	20	432	10	8	6	8	9	43	935	22
7th births	408	28	376	4	7	8	7	4	68	922	10
8th births	335	18	309	8	6	5	6	8	54	922	24
9th births or more	955	70	863	22	17	20	17	21	73	904	23
Maternal diet reported adequate	2,943	148	2,734	61	53	43	53	58	50	929	21
" " " inadequate.....	823	73	737	13	15	21	14	12	89	896	15
Maternal diet reported supplemented	4,649	238	4,322	89	83	70	84	84	51	930	19
" " " not supplemented.....	949	104	828	17	17	30	16	16	110	872	18
Pre-natal supervision (physician).....	2,988	154	2,761	73	53	45	54	69	52	924	24
" " (nurse)	3,015	154	2,788	73	54	45	54	69	51	925	24
" " not recorded	2,583	188	2,362	33	46	55	46	31	73	914	13

Maternal and Child Health Survey 1962

Comparison between the Incidence of "Premature" "Normal" and "Overweight" Infants born to selected categories of mothers

Selected Categories	Number of Births			Percentage Distribution of birth weights by category of mothers				Incidence Rates per 1000 births			
	Total births	"Premature" under 6 lbs. at birth	"Normal" 6 lbs. under 9 lbs. at birth	"Overweight" 9 lbs. or more at birth	Total births	"Premature" under 6 lbs. at birth	"Normal" 6 lbs. under 9 lbs. at birth	"Overweight" 9 lbs. or more at birth	"Premature" under 6 lbs. at birth	"Normal" 6 lbs. under 9 lbs. at birth	"Overweight" 9 lbs. or more at birth
All categories or Indian "average"	5,598	606	4,311	681	100	100	100	100	108	770	122
All "married" women (including common law) ..	4,337	459	3,317	561	77	76	77	82	106	765	129
Unmarried mothers, father not in home	1,247	146	985	116	22	24	23	17	117	790	93
Mothers aged under 15 years	16	0	15	1	0	0	0	0	0	937	63
Mothers aged 15-19 years	729	78	603	48	13	13	14	7	107	827	66
Mothers aged 20-24 years	1,598	153	1,291	154	29	25	30	23	96	808	96
Mothers aged 25-29 years	1,347	136	1,056	155	24	22	24	23	101	784	115
Mothers aged 30-34 years	952	124	682	146	17	20	16	21	130	716	153
Mothers aged 35-39 years	644	80	446	118	12	13	10	17	124	693	183
Mothers aged 40-44 years	244	30	172	42	4	5	4	6	123	705	172
Mothers aged 45 or more	47	5	28	14	1	1	1	2	106	596	298
First births	807	81	666	60	14	13	15	9	100	825	74
2nd births	759	105	596	58	14	17	14	9	138	785	76
3rd births	635	58	509	68	11	10	12	10	91	802	107
4th births	649	59	522	68	12	10	12	10	91	804	105
5th births	588	73	443	72	11	12	10	11	124	753	122
6th births	462	31	364	67	8	5	8	10	67	788	145
7th births	408	58	299	51	7	10	7	7	142	733	125
8th births	335	33	251	51	6	5	6	7	99	749	152
9th births or more	955	108	661	186	17	18	15	27	113	692	195
Winter births (spring conceptions)	1,361	158	1,042	161	24	26	24	24	116	766	118
Spring births (summer conceptions)	1,492	141	1,164	187	27	23	27	27	95	780	125
Summer births (Fall conceptions)	1,464	161	1,120	183	26	27	26	27	110	765	125
Fall births (winter conceptions)	1,236	140	951	145	22	23	22	21	113	769	117
Maternal diet reported adequate	2,943	248	2,316	379	53	41	54	56	84	787	129
" " inadequate	823	140	619	64	15	23	14	9	170	752	78
Maternal diet supplemented	4,649	423	3,648	578	83	70	85	85	91	785	124
" " not supplemented	949	183	663	103	17	30	15	15	193	699	109
Prenatal supervision (physician)	2,988	280	2,325	383	53	46	54	56	94	778	128
Prenatal supervision (nurse)	3,015	273	2,364	378	54	45	55	56	91	784	125
" " not recorded	2,583	333	1,947	303	46	55	45	44	129	754	117

Maternal and Child Health Survey 1962
Birth Weight by Marriage Status of Mother
Numbers

Marriage Status of Mother	Total births	Under 3 lbs.	3 but under 4 lbs.	4 but under 5 lbs.	5 but under 6 lbs.	6 but under 7 lbs.	7 but under 8 lbs.	8 but under 9 lbs.	9 but under 10 lbs.	10 but under more
Single.....	1,247	10	16	30	90	307	442	236	93	23
Married.....	4,128	26	42	113	252	748	1,376	1,038	394	139
Widowed.....	51	0	1	4	1	4	14	18	6	3
Divorced.....	3	0	0	0	1	1	1	0	0	0
Separated.....	45	0	0	0	3	10	15	11	5	1
Common law or aboriginal marriage.....	110	4	2	4	6	29	30	22	11	2
Unknown.....	14	0	0	1	0	3	4	2	4	0
Total.....	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Incidence Rates of Specific Birth Weights per 1000 mothers of each marriage status

Marriage Status of Mother	Total Births	Under 3 lbs.	3 but under 4 lbs.	4 but under 5 lbs.	5 but under 6 lbs.	6 but under 7 lbs.	7 but under 8 lbs.	8 but under 9 lbs.	9 but under 10 lbs.	10 but under more
Single.....	1,000	8	13	24	72	246	354	189	75	18
Married.....	1,000	6	10	27	61	181	333	251	95	34
Widowed.....	1,000	0	20	78	20	78	275	353	118	59
Divorced.....	1,000	0	0	0	333	333	333	0	0	0
Separated.....	1,000	0	0	0	67	222	333	244	111	22
Common law or aboriginal marriage.....	1,000	36	18	36	55	264	273	200	100	18
Unknown.....	1,000	0	0	71	0	214	286	143	286	0
Total.....	1,000	7	11	27	63	197	336	237	92	30

Percentage Distribution of birth weights by Marriage Status of Mothers

Marriage Status of Mother	Total Births	Under 3 lbs.	3 but under 4 lbs.	4 but under 5 lbs.	5 but under 6 lbs.	6 but under 7 lbs.	7 but under 8 lbs.	8 but under 9 lbs.	9 but under 10 lbs.	10 but under more
Single.....	22	25	26	20	25	28	23	18	18	14
Married.....	74	65	69	74	71	68	73	78	77	83
Widowed.....	1	0	2	3	0	0	1	1	1	2
Divorced.....	0	0	0	0	0	0	0	0	0	0
Separated.....	1	0	0	0	1	1	1	1	1	1
Common law or aboriginal marriage.....	2	10	3	3	2	3	2	2	2	1
Unknown.....	0	0	0	1	0	0	0	0	1	0
Total.....	100	100	100	100	100	100	100	100	100	100

Table 57 a

Maternal and Child Health Survey 1962
Birth Weight by Age of Mother
Numbers

Age of Mother	Total Births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
-15	16	0	0	0	0	5	6	4	1	0
15	26	0	2	0	1	6	13	1	3	0
16	73	0	2	4	4	15	27	15	4	2
17	152	0	1	3	5	38	65	32	5	3
18	196	0	3	1	15	50	77	36	14	0
19	282	1	3	10	23	62	104	62	13	4
15-19	729	1	11	18	48	171	286	146	39	9
20	313	3	3	7	16	75	125	61	17	6
21	308	1	2	5	18	68	110	77	23	4
22	334	1	3	9	20	88	108	80	21	4
23	330	3	3	10	15	60	127	71	30	11
24	313	3	2	9	20	54	110	77	30	8
20-24	1,598	11	13	40	89	345	580	366	121	33
25	304	1	1	6	19	58	108	65	36	10
26	275	1	2	1	19	51	91	88	16	6
27	265	1	2	8	18	54	88	58	27	9
28	267	1	3	8	20	58	79	66	29	3
29	236	2	6	7	10	46	85	61	13	6
25-29	1,347	6	14	30	86	267	451	338	121	34
30	234	3	2	9	21	39	65	59	26	10
31	207	3	2	7	12	29	66	59	23	11
32	186	2	3	5	11	39	55	44	17	10
33	152	2	3	5	10	27	54	28	12	11
34	173	2	5	7	15	28	45	45	21	5
30-34	952	12	15	28	69	162	285	235	99	47
35	157	0	3	13	5	17	47	48	18	6
36	134	1	1	4	12	19	36	36	19	6
37	120	1	1	6	4	19	49	17	17	6
38	128	1	1	4	7	22	37	32	19	5
39	105	2	2	2	10	26	22	19	17	5
35-39	644	5	5	29	58	103	191	152	90	28
40	71	0	0	2	9	10	16	19	10	5
41	65	1	0	1	6	10	22	16	6	3
42	62	1	0	3	5	10	11	20	11	1
43	30	0	0	0	1	3	12	11	3	0
44	16	1	0	0	0	3	2	7	2	1
40-44	244	3	0	6	21	36	63	73	32	10
45+	47	2	0	1	2	10	10	8	8	6
Unknown	21	0	0	0	0	3	10	5	2	1
All ages	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Maternal and Child Health Survey 1962
Incidence Rates of Specific Birth Weights
per 1000 children born to mothers of each age

Age of Mother	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
-15	0	0	0	0	313	375	250	63	0
15	0	77	0	38	231	500	38	115	0
16	0	27	55	55	205	370	205	55	27
17	0	7	20	33	250	428	210	33	20
18	0	15	5	77	255	393	184	71	0
19	4	11	35	82	220	369	220	46	14
15-19	1	15	25	66	235	392	200	53	12
20	10	10	22	51	240	399	195	54	19
21	3	6	16	58	221	357	250	75	13
22	3	9	27	60	263	323	240	63	12
23	9	9	30	45	182	385	215	91	33
24	8	25	30	42	195	360	258	55	25
20-24	7	8	25	56	216	363	229	76	21
25	3	3	20	63	191	355	214	118	33
26	4	7	4	69	185	331	320	58	22
27	4	8	30	68	204	332	219	102	34
28	4	11	30	75	217	296	247	109	11
29	8	25	30	42	195	360	258	55	25
25-29	4	10	22	64	198	335	251	90	25
30	13	9	38	90	167	278	252	111	43
31	14	10	10	58	140	319	285	111	53
32	11	16	27	59	210	296	237	91	54
33	13	20	33	66	178	355	184	79	72
34	12	30	40	87	162	260	260	121	29
30-34	13	16	29	72	170	299	247	104	49
35	0	19	83	32	108	299	305	115	38
36	7	7	30	90	142	269	269	142	45
37	8	8	50	33	158	408	142	142	50
38	8	8	31	55	172	289	250	148	39
39	19	19	19	95	248	210	181	162	48
35-39	8	12	45	59	160	297	236	140	43
40	0	0	28	127	140	225	268	140	70
41	15	0	15	92	154	338	246	92	46
42	16	0	48	81	161	177	232	177	16
43	0	0	0	33	100	400	367	100	0
44	62	0	0	0	188	125	438	125	62
40-44	12	0	25	86	148	258	299	131	41
45+	43	0	21	43	213	213	170	170	128
Unknown	0	0	0	0	143	476	238	95	48
All ages	7	11	27	63	197	336	237	92	30

Table 57 c

Maternal and Child Health Survey 1962
Percentage Distribution of Birth Weights
by Age of Mother

Age of Mother	Total Births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
-15	0	0	0	0	0	0	0	0	0	0
15	0	0	3	0	0	1	1	0	1	0
16	1	0	3	3	1	1	1	1	1	1
17	3	0	2	2	1	3	3	2	1	2
18	4	0	5	1	4	5	4	3	3	0
19	5	3	5	7	7	6	6	5	3	2
15-19	13	3	18	12	14	16	15	11	8	5
20	6	7	5	5	5	7	7	5	3	4
21	6	3	3	3	5	6	6	6	4	2
22	6	3	5	6	6	8	6	6	4	2
23	6	7	5	7	4	5	7	5	6	7
24	6	7	3	6	6	5	6	6	6	5
20-24	29	27	21	26	25	31	31	28	24	20
25	5	3	2	4	5	5	6	5	7	6
26	5	3	3	1	5	5	5	7	3	4
27	5	3	3	5	5	5	5	4	5	5
28	5	3	5	5	6	5	4	5	6	2
29	4	5	10	5	3	4	5	5	3	4
25-29	24	15	23	20	24	24	24	25	24	20
30	4	7	3	6	6	4	3	4	5	6
31	4	7	3	1	3	3	3	4	4	7
32	3	5	5	3	3	4	3	3	3	6
33	3	5	5	3	3	2	3	2	2	7
34	3	5	8	5	4	3	2	3	4	3
30-34	17	30	25	18	20	15	15	18	19	28
35	3	0	5	9	1	2	2	4	4	4
36	2	3	2	3	3	2	2	3	4	4
37	2	3	2	4	1	2	3	1	3	4
38	2	3	2	3	2	2	2	2	4	3
39	2	5	3	1	3	2	1	1	3	3
35-39	12	13	13	19	11	9	10	11	17	17
40	1	0	0	1	3	1	1	1	2	3
41	1	3	0	1	2	1	1	1	1	2
42	1	3	0	2	1	1	1	2	2	1
43	1	0	0	0	0	0	1	1	1	0
44	0	3	0	0	0	0	0	1	0	1
40-44	4	7	0	4	6	3	3	6	6	6
45+	1	5	0	1	1	1	1	1	2	3
Unknown	0	0	0	0	0	0	1	0	0	1
All ages	100	100	100	100	100	100	100	100	100	100

Maternal and Child Health Survey 1962
Birth Weight and Birth Rank
Numbers

Birth Rank	Total Births	Under 3 lbs.	3 but under 4 lbs.	4 but under 5 lbs.	5 but under 6 lbs.	6 but under 7 lbs.	7 but under 8 lbs.	8 but under 9 lbs.	9 but under 10 lbs.	10 but under more
1st Child	807	5	4	18	54	210	305	151	55	5
2nd "	759	5	19	22	59	163	281	152	45	13
3rd "	635	2	4	12	40	139	225	145	49	19
4th "	649	2	4	13	40	145	205	172	52	16
5th "	588	4	3	24	42	105	190	148	58	14
6th "	462	2	7	8	14	80	170	114	57	10
7th "	408	6	6	12	34	72	111	116	38	13
8th "	335	6	3	9	15	55	112	84	34	17
9th or more	955	8	11	34	55	133	283	245	125	61
Total	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Incidence Rate of Specific Birth Weights
per 1000 Children of each Birth Rank

Birth Rank	Total Births	Under 3 lbs.	3 but under 4 lbs.	4 but under 5 lbs.	5 but under 6 lbs.	6 but under 7 lbs.	7 but under 8 lbs.	8 but under 9 lbs.	9 but under 10 lbs.	10 lbs. or more
1st Child	1,000	6	5	22	67	260	378	187	68	6
2nd "	1,000	7	25	29	78	215	370	200	59	17
3rd "	1,000	3	6	19	63	219	354	228	77	30
4th "	1,000	3	6	20	62	223	316	265	80	25
5th "	1,000	7	5	41	71	179	323	252	99	24
6th "	1,000	4	15	17	30	173	368	247	123	22
7th "	1,000	15	15	29	83	176	272	284	93	32
8th "	1,000	18	9	27	45	164	334	251	101	51
9th or more	1,000	8	12	36	58	139	296	257	131	64
Total	1,000	7	11	27	63	197	336	237	92	30

Percentage Distribution
of birth weights by birth rank

Birth Rank	Total Births	Under 3 lbs.	3 but under 4 lbs.	4 but under 5 lbs.	5 but under 6 lbs.	6 but under 7 lbs.	7 but under 8 lbs.	8 but under 9 lbs.	9 but under 10 lbs.	10 lbs. or more
1st Child	14	13	7	12	15	19	16	11	11	3
2nd "	14	13	31	14	17	15	15	11	9	8
3rd "	11	5	7	8	11	13	12	11	10	11
4th "	12	5	7	9	11	13	11	13	10	10
5th "	11	10	5	16	12	10	10	11	11	8
6th "	8	5	11	5	4	7	9	9	11	6
7th "	7	15	10	8	9	7	6	9	7	8
8th "	6	15	5	6	4	5	6	6	7	10
9th or more	17	20	18	22	16	12	15	18	24	36
Total	100	100	100	100	100	100	100	100	100	100

Maternal and Child Health Survey 1962
Birth Weight by Calendar Month of Birth and Season of Year Numbers

Calendar Month of birth	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
December	381	4	3	3	24	85	133	84	36	9
January	506	3	5	14	34	93	167	124	51	15
February	474	4	8	15	41	93	150	113	39	11
Winter months.....	1,361	11	16	32	99	271	450	321	126	35
March.	520	0	7	8	27	94	203	126	38	17
April	482	3	3	20	21	79	169	113	58	16
May	490	6	2	12	32	102	157	121	49	9
Spring months.....	1,492	9	12	40	80	275	529	360	145	42
June.....	509	2	6	9	36	101	167	130	45	13
July	470	2	3	19	25	98	147	111	46	19
August.....	485	2	2	18	37	103	152	111	45	15
Summer months.....	1,464	6	11	46	98	302	466	352	136	47
September	416	10	10	9	22	82	142	75	48	18
October	427	1	5	15	25	86	148	104	26	17
November	393	3	6	7	27	78	130	106	27	9
Fall months	1,236	14	21	31	74	246	420	285	101	44
Unknown	45	0	1	3	2	8	17	9	5	0
Total	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Maternal and Child Health Survey 1962
Incidence of Specific Birth Weights per 1000 children born in each Calendar Month

Calendar Month of birth	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
December.....	1,000	10	8	8	63	223	349	220	94	24
January.....	1,000	6	10	28	67	184	330	245	101	30
February.....	1,000	8	17	32	86	196	316	238	82	23
Winter months.....	1,000	8	12	24	73	199	331	236	93	26
March	1,000	0	13	15	52	181	390	242	73	33
April	1,000	6	6	41	44	164	351	234	120	33
May	1,000	12	4	24	65	208	320	247	100	18
Spring months	1,000	6	8	27	54	184	355	241	97	28
June.....	1,000	4	12	18	71	198	328	255	88	26
July.....	1,000	4	6	40	53	209	313	236	98	40
August.....	1,000	4	4	37	76	212	313	229	93	31
Summer months	1,000	4	8	31	67	206	318	240	93	32
September	1,000	24	24	22	53	197	341	180	115	43
October	1,000	2	12	35	59	201	347	244	61	40
November	1,000	8	15	18	69	198	331	270	69	23
Fall months	1,000	11	17	25	60	199	340	231	82	36
Unknown.....	1,000	0	22	67	44	178	378	200	111	0
Total.....	1,000	7	11	27	63	197	336	237	92	30

Maternal and Child Health Survey 1962
Percentage Distribution of birth weights by month of birth

Calendar Month of birth	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
December	7	10	5	2	7	8	7	6	7	5
January	9	8	8	9	10	8	9	9	10	9
February	8	10	13	10	12	8	8	9	8	7
Winter months	24	28	26	21	28	25	24	24	25	21
March	9	0	11	5	8	9	11	9	7	10
April	9	8	5	13	6	7	9	9	11	10
May	9	15	3	8	9	9	8	9	10	5
Spring months	27	23	20	26	23	25	28	27	28	25
June	9	5	10	6	10	9	9	10	9	8
July	8	5	5	13	7	9	8	8	9	11
August	9	5	3	12	10	9	8	8	9	9
Summer months	26	15	18	30	28	27	25	27	27	28
September	7	25	16	6	6	7	8	7	9	11
October	8	3	8	10	7	8	8	8	5	10
November	7	8	10	5	8	7	7	8	5	5
Fall months	22	35	34	20	21	22	22	21	20	26
Unknown	1	0	2	2	1	1	1	1	1	0
Total	100	100	100	100	100	100	100	100	100	100

Maternal and Child Health Survey 1962
Birth Weights by Adequacy of Mother's Diet
Numbers

Adequacy of Mother's diet	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
Adequate.....	2,943	3	19	56	170	547	1,032	737	291	88
Inadequate.....	823	7	11	36	86	197	258	164	51	13
Fair.....	24	0	0	1	2	8	10	1	2	0
Reported as unknown.....	123	3	8	6	14	26	40	14	8	4
Not reported.....	1,685	27	23	53	81	324	542	411	161	63
Total.....	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Incidence of Specific Birth Weights
per 1000 Children by Adequacy of Mother's Diet

Adequacy of Mother's diet	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
Adequate.....	1,000	1	6	19	58	186	351	250	99	88
Inadequate.....	1,000	9	13	44	104	239	313	199	62	16
Fair.....	1,000	0	0	42	83	333	417	42	83	0
Reported as unknown.....	1,000	24	65	49	114	211	325	114	65	33
Not reported.....	1,000	16	14	31	48	192	322	244	95	37
Total.....	1,000	7	11	27	63	197	336	237	92	30

Percentage Distribution
of Birth Weights by Adequacy of Mother's Diet

Adequacy of Mother's diet	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
Adequate.....	53	8	31	37	48	50	55	56	57	52
Inadequate.....	15	18	18	24	24	18	14	12	10	8
Fair.....	0	0	0	1	1	1	0	0	0	0
Reported as unknown.....	2	8	13	4	4	2	2	1	2	2
Not reported.....	30	67	38	35	29	29	29	31	31	38
Total.....	100	100	100	100	100	100	100	100	100	100

Maternal and Child Health Survey 1962
Birth Weights by Supplementing Mother's Diet
Numbers

Nature of Supplement	Total Births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
Pre-natal capsules only	189	1	7	3	13	36	55	42	23	9
Other supplements only	2,303	2	19	61	158	492	742	577	185	67
Capsules and other supplements	2,157	0	7	30	122	399	766	539	224	70
Total supplemented	4,649	3	33	94	293	927	1,563	1,158	432	146
Not supplemented	949	37	28	58	60	175	319	169	81	22
Total	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Incidence Rate of Specific Birth Weights
per 1000 children born to Mothers with or without Supplemented Diets

Nature of Supplement	Total Births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
Pre-natal capsules only	1,000	5	37	16	69	190	291	222	122	48
Other supplements only	1,000	1	8	26	69	214	322	251	80	29
Capsules and other supplements	1,000	0	3	14	57	185	355	250	104	32
Total supplemented	1,000	1	7	20	63	199	336	249	93	31
Not supplemented	1,000	39	30	61	63	184	336	178	85	23
Total	1,000	7	11	27	63	197	336	237	92	30

Percentage Distribution
of birth weights by supplementing mother's diet

Nature of Supplement	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
Pre-natal capsules only	3	3	11	2	3	3	3	3	4	5
Other supplements only	41	5	31	40	45	45	40	43	36	40
Capsules and other supplements	39	0	11	20	35	36	40	40	44	42
Total supplemented	83	8	54	62	83	84	83	87	84	87
Not supplemented	17	92	46	38	17	16	17	13	16	13
Total	100	100	100	100	100	100	100	100	100	100

Maternal and Child Survey 1962
Birth Weights by Pre-natal Supervision by a Physician Numbers

Period of pre-natal supervision by a physician	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
All three trimesters	659	0	6	12	42	115	225	182	54	23
2nd & 3rd "	990	1	10	29	55	197	345	230	99	24
1st & 2nd "	25	3	1	1	0	1	11	0	5	3
1st & 3rd "	57	1	0	4	2	8	18	17	5	2
3rd trimester only	1,088	1	7	19	65	189	392	270	111	34
2nd "	108	3	2	4	7	23	35	19	14	1
1st "	61	2	0	0	3	14	23	11	5	3
Total supervised.....	2,988	11	26	69	174	547	1,049	729	293	90
Unsupervised.....	2,610	29	35	83	179	555	833	598	220	78
Total.....	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Birth Weight by Pre-natal Supervision by a Nurse Numbers

Period of pre-natal supervision by a nurse	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
All three trimesters.....	613	1	6	12	33	127	213	143	59	19
2nd & 3rd "	1,154	1	5	20	67	227	400	288	120	26
1st & 2nd "	40	3	2	1	0	4	17	10	1	2
1st & 3rd "	34	0	0	3	1	5	13	9	3	0
3rd trimester only	982	1	7	14	68	167	356	242	95	32
2nd "	139	1	3	6	12	30	45	28	10	4
1st "	53	1	2	1	2	8	23	9	5	2
Total supervised.....	3,015	8	25	57	183	568	1,067	729	293	85
Unsupervised.....	2,583	32	36	95	170	534	815	598	220	83
Total.....	5,598	40	61	152	353	1,102	1,882	1,327	513	168

Maternal and Child Health Survey 1962
Incidence Rate of Specific Birth Weights
per 1000 births receiving Pre-Natal Supervision by a Physician

Period of pre-natal supervision by a physician	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
All three trimesters.....	1,000	0	9	18	64	175	341	276	82	35
2nd & 3rd trimesters.....	1,000	1	10	29	56	199	348	232	100	24
1st & 2nd trimesters.....	1,000	120	40	40	0	40	440	0	200	120
1st & 3rd trimesters.....	1,000	18	0	70	35	140	316	298	88	35
3rd trimester only.....	1,000	1	6	17	60	174	360	248	102	31
2nd trimester only.....	1,000	28	19	37	65	213	324	176	130	9
1st trimester only.....	1,000	33	0	0	49	230	377	180	82	49
Total supervised.....	1,000	4	9	23	58	183	350	244	98	30
Unsupervised.....	1,000	11	13	32	69	213	319	229	84	30
Total.....	1,000	7	11	27	63	197	336	237	92	30

Incidence Rate of Specific Birth Weights
per 1000 births receiving Pre-Natal Supervision by a Nurse

Period of pre-natal supervision by a nurse	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
All three trimesters.....	1,000	2	10	20	54	207	347	233	96	31
2nd & 3rd trimesters.....	1,000	1	4	17	58	197	347	250	104	23
1st & 2nd trimesters.....	1,000	75	50	25	0	100	425	250	25	50
1st & 3rd trimesters.....	1,000	0	0	88	29	147	382	265	88	0
3rd trimester only.....	1,000	1	7	14	69	170	363	246	97	33
2nd trimester only.....	1,000	7	22	43	86	216	324	201	72	29
1st trimester only.....	1,000	18	38	18	38	151	434	170	94	38
Total supervised.....	1,000	3	8	19	61	188	354	242	97	28
Unsupervised.....	1,000	12	14	37	66	207	316	232	85	32
Total.....	1,000	7	11	27	63	197	336	237	92	30

Maternal and Child Health Survey 1962
Percentage Distribution of Birth Weights
by Duration of Pre-natal Supervision by a Physician

Period of pre-natal supervision by a physician	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
All three trimesters.....	12	0	10	8	12	10	12	14	11	14
2nd & 3rd ".....	18	3	16	19	16	18	18	17	19	14
1st & 2nd ".....	0	8	2	1	0	0	1	0	1	2
1st and 3rd ".....	1	3	0	3	1	1	1	1	1	1
3rd trimester only.....	19	3	11	13	18	17	21	20	22	20
2nd ".....	2	8	3	3	2	2	2	1	3	1
1st ".....	1	5	0	0	1	1	1	1	1	2
Total supervised.....	53	28	43	45	49	50	56	55	57	54
Unsupervised.....	46	73	57	55	51	50	44	45	43	46
Total.....	100	100	100	100	100	100	100	100	100	100

Percentage Distribution of Birth Weights
by Duration of Pre-natal Supervision by a Nurse

Period of pre-natal supervision by a physician	Total births	Under 3 lbs.	3 lbs. under 4 lbs.	4 lbs. under 5 lbs.	5 lbs. under 6 lbs.	6 lbs. under 7 lbs.	7 lbs. under 8 lbs.	8 lbs. under 9 lbs.	9 lbs. under 10 lbs.	10 lbs. or more
All three trimesters.....	11	3	10	8	9	12	11	11	12	11
2nd & 3rd ".....	21	3	8	13	19	21	21	22	23	15
1st & 2nd ".....	1	8	3	1	0	0	1	1	0	1
1st & 3rd ".....	1	0	0	2	0	0	1	1	1	0
3rd trimester only.....	18	3	11	10	19	15	19	18	19	19
2nd ".....	2	3	5	4	3	3	2	2	2	2
1st ".....	1	3	3	1	1	1	1	1	1	1
Total supervised.....	54	20	41	38	52	52	57	55	57	51
Unsupervised.....	46	80	59	63	48	48	43	45	43	49
Total.....	100	100	100	100	100	100	100	100	100	100

The group of mothers who got some pre-natal supervision, comprising 54% of all mothers, gave birth to only 20% of the infants weighing less than 3 lbs at birth. The 46% who got no supervision gave birth to 80% of those tiny premature infants. The unsupervised group also accounted for 59% of the 3-4 lbs infants and 63% of the 4-5 lbs births. The need to improve pre-natal services is evident.

INCIDENCE OF CONGENITAL ABNORMALITIES

It has been suspected that congenital abnormalities may be commoner among Indians than among other ethnic groups. This is reasonable as the Indian population is relatively small, numbering in all until quite recently less than 200,000 and broken up into relatively small groups widely dispersed with the result that recessive genes have a greater mathematical chance of combining than amongst larger populations mingling more freely. Accordingly a special study was made of the incidence of congenital abnormalities among the Indian children born in 1962. Congenital defects were particularly well reported and more fully documented than many other items on the questionnaire.

The incidence rate

The overall incidence of congenital defects among the 5598 infants born in 1962 was 25 per 1000 births. Unfortunately comparable rates calculated on the same basis are not readily available for Canada as a whole but this does seem to be a significantly high rate, being comparable to the national total infant mortality rate. It must be stressed however, that this rate is a morbidity rate, not a mortality rate, estimated on the births that year, not the population. The nearest comparable Canadian incidence rate, based on physicians' notifications of birth, suggests an incidence of 15 per 1000 but the data are probably incomplete. One American study, including abnormalities diagnosed over the first five years of life, suggests 5% of births show some abnormality eventually but each year more became apparent. The incidence of congenital abnormalities detected at birth or during the first year of life is difficult to ascertain with accuracy so that it is impossible to say whether or not an incidence of congenital defects reported during the first year of life of 25 per 1000 births (i. e. some 3% of all births) is unusually high but it does exceed the best estimate yet available for Canadian births as a whole. The problem is currently under intensive study, particularly in Ontario and British Columbia.

Specific incidence rates of congenital abnormalities

Among Indian infants born in 1962, the incidence of specific types of congenital abnormalities ranked as follows:

<u>Rank</u>	<u>Defect</u>	<u>Rate</u>			
1.	Defects of bones and joints	357	per	100,000	births
2.	Defects of neurological system	339	"	"	"
3.	Cleft palate	250	"	"	"
4.	Other defects of the alimentary system	232	"	"	"
5.	Defects of the circulatory system	179	"	"	"
6.	Hydrocephalus	143	"	"	"
7.	Defects of the genito-urinary system	107	"	"	"
8.	Spina bifida	89	"	"	"
9.	Monstrosities (2)	36	"	"	"

All other unclassified defects together had an incidence rate of 768 per 100,000 births. Canadian Indians were never exposed to the risk of thalidomide and the birth of an Indian "thalidomide baby" has never been reported, yet approximately, 4 in every 1000 infants born in 1962 had a congenital defect of the bones and joints diagnosed in the first year of life and, including hydrocephalus, approximately 5 in every 1000 born had some defect in the neurological system.

It is almost certain that further defects will become apparent as life advances. It was noted previously that, whereas the infant mortality associated with congenital defects among Indians did not differ significantly from the mortality among all Canadian infants from such causes, mortality at older ages did exceed the national mortality rate from congenital causes. This has been reported in successive years in Indian Vital Statistics reports issued by the Department of National Health and Welfare.

Influence of age of mother on incidence of congenital defects

There appears to be a definite association between the age of the mother and the incidence rate of congenital defects as a whole. The incidence of congenital defects was high among the children of teenaged mothers, dropped significantly among children born to mothers aged 20-29 then tended to rise steadily with each five year increase in age to peak among the children born to mothers aged 45 or more. The incidence of all types of congenital defects was relatively high among children of teenaged mothers but defects of the bones and joints were actually greatest among the children of mothers aged 25-29 and diminished with increasing age. The figures for 1962 would seem to suggest that this type of congenital abnormality may be a greater hazard among children of younger mothers, unlike other defects but it could have been purely a matter of chance. The small numbers of defects reported among mothers of any given age make individual age specific rates very erratic but the differences are not of marked statistical significance and do little more than hint at a possible trend. Hydrocephalus appeared to be the major risk among children of more elderly mothers. Spina bifida appeared to be more prevalent among children born to women in their late thirties. Other defects of the neurological system appeared to be commoner among children of mothers over 40 as was also cleft palate, excluding the relatively high incidence of that condition among children of teenaged mothers. Defects of the circulatory system mainly affected the infants born to women in their late thirties whereas defects of the alimentary system affected mainly children of women in their earlier thirties. Defects of the genito-urinary system affected mainly the children of teen-aged mothers and tended to diminish with advancing age, following a pattern more akin to that of the bone and joint abnormalities than the other congenital defects. This study of one year's experience is, of course, much too subject to the vagaries of chance to permit of drawing any firm conclusions but it does suggest that the very young and more elderly mothers are more liable to have abnormal children and that particular defects may be somewhat commoner among children born to mothers of a specific age. Much more precise studies are indicated if the facts are to be ascertained with greater accuracy.

The effect of birth rank on incidence of congenital defects

Birth rank, especially among Indian mothers, being largely a function of the age of the mother, could be expected to reflect the influence of age and to separate the influence, if any, of repeated pregnancy as distinct from age is difficult. In this case it was not specifically attempted as the necessary breakdown resulted in individual figures too small for reliable comparison. However the highest incidence of congenital defects was among the first born and diminished steadily

and quite significantly with each successive child up to the fourth after which it rose steadily with increasing birth rank. This lends some additional support to the suggestion made earlier that four children are probably the optimum family one woman should have. The majority of Indian mothers, however, appear to have borne four children before they are 25 years of age i. e. the optimum period for bearing children. The relatively high incidence among first and second born children is interesting and is probably associated with the high incidence shown among children of teenaged mothers who also, it will be recalled, had a high prematurity rate. The majority of first and second children were probably born to teenaged mothers. The incidence of congenital defects is probably more influenced by the physiological health and maturity of the mother and, possibly, the father than by the number of previous pregnancies save that rapidly repeated pregnancies would probably adversely affect the health of the mother, adding to or accelerating the effect of advancing age, a secondary rather than a primary effect.

Duration of pregnancy and congenital defects

There was a very marked significant difference between the incidence of congenital defects in children born with less than eight months gestation and those with more than eight months gestation. The incidence rate rose also among children with prolonged gestation periods. Did the abnormal gestation period produce the abnormal child or the congenital abnormality influence the gestation period? Overterm children suffered from defects of the neurological system, genito-urinary system and "other" defects. Not much significance can however be placed on the incidence rates of specific congenital defects as the actual numbers involved in this breakdown are much too small for significant statistical evaluation. Only the gross total rates have any really significant variation. That there should be more congenital abnormalities among immature infants born prematurely is not unreasonable.

The month and season of birth and congenital defects

The incidence of congenital abnormalities was quite significantly higher among children born during the winter months and lower among those born in the summer.. This table compares and contrasts interestingly with those dealing with the seasonal variation in infant mortality and the prematurity rates. In 1962, at least, the peak months for children born with congenital abnormalities were January and December. Children born during the winter in the majority of cases presumably were conceived in the spring and would be in the first trimester of gestation at that time of year when Indian women are liable to get engaged in more strenuous activities than at some other seasons of the year. The lowest incidence was recorded among children born in August. The majority of those, presumably, would have been conceived in November and the first trimester passed during the winter months when maternal activities would tend, per force, in general to be more restricted. Children born in September, it will be recalled, were marked by a high rate of prematurity but the incidence of congenital defects was, if anything, rather below "average". Presumably these children were conceived later in the winter months but were well through the first trimester of gestation before the peak of maternal spring and summer activity. There is a possibility indicated, worthy of further investigation, that the cyclic exertions of Indian women inherent in their cultural pattern may have a direct bearing on both premature births and congenital defects depending on what stage of gestation their child happens to have reached. If special spring or summer exertions happen to coincide with the first three months of gestation, the chances of bearing a child with some congenital defect, particularly a cleft palate or some defect of the bones and joints, did seem to be increased. The effect on pregnancies in the second trimester seemed to be to increase the risk of premature births but not necessarily the risk of congenital malformation.

Table 63

Maternal and Child Health Survey 1962
Congenital Abnormalities by Age of Mother

Age of Mother	Total Births	Numbers of Congenital Abnormalities by Age of Mother										Total congenital abnormalities
		Monster	Spina bifida	Hydrocephalus	Nervous system	Circulatory system	Cleft palate	Digestive system	Genito-urinary system	Bones and Joints	Other	
-15	16	0	0	0	0	0	0	0	0	0	0	0
15	26	0	0	0	0	0	0	0	0	0	1	1
16	73	0	0	1	1	0	1	1	0	0	0	4
17	152	0	0	0	0	0	0	0	2	2	3	7
18	196	0	1	0	1	0	1	0	0	1	1	5
19	282	0	0	2	2	0	2	1	0	1	4	12
15-19	729	0	1	3	4	0	4	2	2	4	9	29
20	313	0	0	0	1	1	2	0	0	0	3	7
21	308	0	0	0	0	1	2	0	0	1	3	7
22	334	0	0	0	0	0	0	2	0	0	1	3
23	330	0	2	0	1	0	1	0	0	1	3	8
24	313	0	0	1	1	0	1	0	1	1	3	8
20-24	1,598	0	2	1	3	2	6	2	1	3	13	33
25	304	0	0	0	0	0	0	0	1	0	2	3
26	275	1	0	0	1	0	0	1	0	2	2	7
27	265	0	0	0	1	0	0	0	1	3	1	6
28	267	0	0	0	0	1	1	0	0	1	3	6
29	236	0	0	0	2	0	0	0	0	2	1	5
25-29	1,347	1	0	0	4	1	1	1	2	8	9	27
30	234	0	0	1	1	2	0	1	0	1	4	10
31	207	1	0	0	0	1	1	1	0	0	0	4
32	186	0	0	1	0	0	0	3	0	1	1	6
33	152	0	0	0	0	0	1	1	0	0	0	2
34	173	0	0	0	0	0	0	1	0	1	0	2
30-34	952	1	0	2	1	3	2	7	0	3	5	24
35	157	0	1	0	1	0	0	0	1	1	3	7
36	134	0	1	0	1	0	0	0	0	1	0	3
37	120	0	0	0	2	1	0	1	0	0	0	4
38	128	0	0	0	1	1	0	0	0	0	0	2
39	105	0	0	0	0	2	0	0	0	0	0	2
35-39	644	0	2	0	5	4	0	1	1	2	3	18
40	71	0	0	0	1	0	1	0	0	0	2	4
41	65	0	0	0	1	0	0	0	0	0	0	1
42	62	0	0	0	0	0	0	0	0	0	1	1
43	30	0	0	1	0	0	0	0	0	0	0	1
44	16	0	0	0	0	0	0	0	0	0	0	0
40-44	244	0	0	1	2	0	1	0	0	0	3	7
45+	47	0	0	1	0	0	0	0	0	0	1	2
Unknown	21	0	0	0	0	0	0	0	0	0	0	0
Total	5,598	2	5	8	19	10	14	13	6	20	43	140

Table 64

Maternal and Child Health Survey 1962
Incidence Rate of Congenital Abnormalities by Age of Mother

Age of Mother	Incidence of Congenital Abnormalities per 100,000 births by age of mother										
	Monster	Spina bifida	Hydrocephalus	Nervous System	Circulatory system	Cleft palate	Digestive system	Genito-urinary system	Bones and Joints	Other	Total congenital abnormalities
-15	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	3,846	3,846
16	0	0	1,370	1,370	0	1,370	1,370	0	0	0	5,479
17	0	0	0	0	0	0	0	1,316	1,316	1,974	4,605
18	0	510	0	510	0	510	0	0	510	510	2,551
19	0	0	709	709	0	709	355	0	355	1,418	4,255
15-19	0	137	412	549	0	549	274	274	549	1,235	3,978
20	0	0	0	319	319	639	0	0	0	958	2,236
21	0	0	0	0	325	649	0	0	325	974	2,273
22	0	0	0	0	0	0	599	0	0	299	898
23	0	606	0	303	0	303	0	0	303	909	2,424
24	0	0	319	319	0	319	0	319	319	958	2,556
20-24	0	125	63	188	125	375	125	63	188	814	2,065
25	0	0	0	0	0	0	0	329	0	658	987
26	364	0	0	364	0	0	364	0	727	727	2,545
27	0	0	0	377	0	0	0	377	1,132	377	2,264
28	0	0	0	0	375	375	0	0	375	1,124	2,247
29	0	0	0	847	0	0	0	0	847	424	2,119
25-29	74	0	0	297	74	74	74	148	594	668	2,004
30	0	0	427	427	855	0	427	0	427	1,709	4,274
31	483	0	0	0	483	483	483	0	0	0	1,932
32	0	0	538	0	0	0	1,613	0	538	538	3,226
33	0	0	0	0	0	658	658	0	0	0	1,316
34	0	0	0	0	0	0	578	0	578	0	1,156
30-34	105	0	210	105	315	210	735	0	315	525	2,521
35	0	637	0	637	0	0	0	637	637	1,911	4,459
36	0	746	0	746	0	0	0	0	746	0	2,239
37	0	0	0	1,667	833	0	833	0	0	0	3,333
38	0	0	0	781	781	0	0	0	0	0	1,562
39	0	0	0	0	1,908	0	0	0	0	0	1,908
35-39	0	311	0	776	621	0	155	155	311	466	2,795
40	0	0	0	1,408	0	1,408	0	0	0	2,817	5,634
41	0	0	0	1,538	0	0	0	0	0	0	1,538
42	0	0	0	0	0	0	0	0	0	1,613	1,613
43	0	0	3,333	0	0	0	0	0	0	0	3,333
44	0	0	0	0	0	0	0	0	0	0	0
40-44	0	0	410	820	0	410	0	0	0	1,230	2,869
45+	0	0	2,128	0	0	0	0	0	0	2,128	4,255
Unknown	0	0	0	0	0	0	0	0	0	0	0
Total	36	89	143	339	179	250	232	107	357	768	2,500

Maternal and Child Health Survey 1962
Congenital Abnormalities by Birth Rank of Child

Birth Rank	Total Births	Number of Congenital Abnormalities in each Birth Rank of Child										Total congenital abnormalities
		Monster	Spina bifida	Hydrocephalus	Nervous system	Circulatory system	Cleft palate	Digestive system	Genito-urinary system	Bones and Joints	Other	
1st Child	807	1	1	2	3	1	3	1	2	5	8	27
2nd "	759	0	1	1	4	0	5	1	0	2	5	19
3rd "	635	0	1	0	3	0	1	2	1	1	4	13
4th "	649	0	0	0	1	1	1	1	1	2	4	11
5th "	588	1	1	0	1	1	0	1	0	2	6	13
6th "	462	0	0	1	1	2	1	2	0	4	1	12
7th "	408	0	0	0	2	2	0	1	1	0	4	10
8th "	335	0	0	0	2	1	0	1	0	2	3	9
9th "	955	0	1	4	2	2	3	3	1	2	8	26
All ranks	5,598	2	5	8	19	10	14	13	6	20	43	40

Incidence Rate of Congenital Abnormalities by Birth Rank of Child

Birth Rank	Total Births	Incidence of congenital abnormalities per 100,000 births by birth rank of child										Total congenital abnormalities
		Monster	Spina bifida	Hydrocephalus	Nervous system	Circulatory system	Cleft palate	Digestive system	Genito-urinary system	Bones and Joints	Other	
1st Child	100,000	124	124	248	352	124	372	124	248	620	991	3,546
2nd "	"	0	132	132	527	0	659	132	0	264	659	2,503
3rd "	"	0	157	0	472	0	157	315	157	157	630	2,047
4th "	"	0	0	0	154	154	154	154	154	308	616	1,695
5th "	"	170	170	0	170	170	0	170	0	340	1,020	2,211
6th "	"	0	0	216	216	433	216	433	0	866	216	2,597
7th "	"	0	0	0	490	490	0	245	245	0	980	2,451
8th "	"	0	0	0	597	299	0	299	0	597	896	2,687
9th "	"	0	105	419	209	209	314	314	105	209	838	2,723
All ranks	100,000	36	89	143	339	179	250	232	107	357	768	2,500

Maternal and Child Health Survey 1962
Congenital Abnormalities by Duration of Pregnancy

Duration of Pregnancy	Total Births	Number of Congenital Abnormalities by Duration of Pregnancy										Total congenital abnormalities
		Monster	Spina bifida	Hydrocephalus	Nervous System	Circulatory system	Cleft palate	Digestive system	Genitourinary system	Bones and Joints	Other	
Under 7 mths	41	1	0	0	1	0	0	0	0	1	1	4
7 mths but under 8 mths	79	0	0	0	2	0	1	1	0	0	6	10
8 mths but under 9 mths	222	0	0	0	2	1	0	0	1	3	5	12
9 mths but under 10 mths	5,150	1	5	8	13	9	13	12	4	16	30	111
10 mths or more	106	0	0	0	1	0	0	0	1	0	1	3
Total	5,598	2	5	8	19	10	14	13	6	20	43	140

Incidence Rate of Abnormal Births by Duration of Pregnancy

Duration of Pregnancy	Total Births	Incidence of congenital abnormalities per 100,000 births by duration of pregnancy										Total congenital abnormalities
		Monster	Spina bifida	Hydrocephalus	Nervous system	Circulatory system	Cleft palate	Digestive system	Genitourinary system	Bones and Joints	Other	
Under 7 mths.....	100,000	2,439	0	0	2,439	0	0	0	0	2,439	2,439	9,756
7 but under 8 mths.....	"	0	0	0	2,532	0	1,266	1,266	0	0	7,595	12,658
8 but under 9 mths.....	"	0	0	0	901	450	0	0	450	1,351	2,252	5,405
9 but under 10 mths.....	"	19	97	155	252	175	252	233	78	311	583	2,155
10 mths or more	"	0	0	0	943	0	0	0	943	0	943	2,830
Total	100,000	36	89	143	339	179	250	232	107	357	768	2,500

Maternal and Child Health Survey 1962
Congenital Abnormalities by Month of Birth and Season of Year

Calendar Month of Birth	Total births	Number of Congenital Abnormalities at Each Month of Birth										Total Congenital abnormalities
		Monster	Spina bifida	Hydrocephalus	Nervous system	Circulatory system	Cleft palate	Digestive system	Genito-urinary system	Bones and Joints	Other	
December.....	381	0	1	1	0	0	3	0	0	3	6	14
January.....	506	0	1	0	2	1	2	5	1	2	5	19
February.....	474	0	0	2	3	0	1	0	1	1	3	11
Winter.....	1,361	0	2	3	5	1	6	5	2	6	14	44
March.....	520	0	0	1	3	0	3	0	0	3	4	14
April.....	482	1	1	0	1	0	0	1	0	0	4	8
May.....	490	0	1	0	5	1	1	3	1	2	1	15
Spring.....	1,492	1	2	1	9	1	4	4	1	5	9	37
June.....	509	1	0	1	1	1	1	1	0	3	4	13
July.....	470	0	0	0	1	4	1	1	2	2	1	12
August.....	485	0	0	0	1	1	0	0	0	0	3	5
Summer.....	1,464	1	0	1	3	6	2	2	2	5	8	30
September.....	416	0	0	1	1	1	0	0	1	2	4	10
October.....	427	0	0	1	0	0	1	0	0	1	4	7
November.....	393	0	1	1	1	1	1	2	0	1	3	11
Autumn.....	1,236	0	1	3	2	2	2	2	1	4	11	28
Unknown.....	45	0	0	0	0	0	0	0	0	0	1	1
Total.....	5,598	2	5	8	19	10	14	13	6	20	43	140

Maternal and Child Health Survey 1962
Incident of Congenital Abnormalities by Each Month of Birth and Season of Year

Calendar Month of birth	Incidence Rate per 100,000 births by each Month of Birth and Season of Year										
	Monster	Spina bifida	Hydro- cephalus	Nervous system	Circulatory system	Cleft palate	Digestive system	Genito- urinary system	Bones and System	Other	Total congen- ital abnor- malities
December.....	0	262	262	0	0	787	0	0	787	1,575	3,675
January.....	0	198	0	395	198	395	988	198	395	988	3,755
February.....	0	0	422	633	0	211	0	211	211	633	2,321
Winter.....	0	147	220	367	73	441	367	147	441	1,029	3,233
March.....	0	0	192	577	0	577	0	0	577	769	2,692
April.....	207	207	0	207	0	0	207	0	0	830	1,660
May.....	0	204	0	1,020	204	204	612	204	408	204	3,061
Spring.....	67	134	67	603	67	268	268	67	335	603	2,480
June.....	196	0	196	196	196	196	196	0	589	786	2,554
July.....	0	0	0	213	851	213	213	426	426	213	2,553
August.....	0	0	0	206	206	0	0	0	0	619	1,031
Summer.....	68	0	68	205	410	137	137	137	342	546	2,049
September.....	0	0	240	240	240	0	0	240	480	962	2,404
October.....	0	0	234	0	0	234	0	0	234	937	1,639
November.....	0	254	254	254	254	254	509	0	254	763	2,799
Autumn.....	0	81	243	162	162	162	162	81	324	890	2,265
Unknown.....	0	0	0	0	0	0	0	0	0	2,222	2,222
Total.....	36	89	143	339	179	250	232	107	357	768	2,500

Maternal and Child Health Survey 1962
Congenital Abnormalities by Certain Factors affecting Pregnancy

Factors affecting pregnancy	Total births	Number of Abnormal Births										Total congenital abnormalities
		Monster	Spina bifida	Hydrocephalic	Nervous system	Circulatory system	Cleft palate	Digestive system	Genito-urinary system	Bones and Joints	Other	
Pre-natal supervision by a physician	2,988	1	4	5	11	8	10	8	3	12	23	85
Pre-natal supervision by a nurse	3,015	0	3	5	10	7	11	3	2	12	25	78
No pre-natal supervision	2,583	1	1	3	8	2	4	5	3	8	20	55
Maternal diet adequate	2,943	2	3	5	11	6	8	6	3	10	21	75
Maternal diet inadequate	847	0	0	3	5	2	2	5	1	5	13	36
Maternal diet unknown	1,808	0	2	0	3	2	4	2	2	5	9	29

Incidence Rate of Congenital Abnormalities in each Category

Factors affecting pregnancy	Total births	Incidence Rate per 100,000 births of congenital abnormalities										Total congenital abnormalities
		Monster	Spina bifida	Hydrocephalic	Nervous system	Circulatory system	Cleft palate	Digestive system	Genito-urinary system	Bones and Joints	Other	
Pre-natal supervision by a physician	100,000	33	134	167	368	268	335	268	100	402	770	2,845
Pre-natal supervision by a nurse	100,000	0	100	166	332	232	366	100	66	399	829	2,587
No pre-natal supervision	100,000	39	39	116	310	77	155	194	116	310	774	2,129
Maternal diet adequate	100,000	68	102	170	374	204	272	204	102	340	714	2,548
Maternal diet inadequate	100,000	0	0	354	590	236	236	590	118	590	1,535	4,250
Maternal diet unknown	100,000	0	111	0	166	111	221	111	111	277	498	1,604

Pre-natal supervision and congenital abnormalities

It is evident that pre-natal supervision made no difference on whether or not the child born would or would not have some congenital abnormality. Whether this shall or shall not be appears to be determined at conception or, if subject to influence by other factors at all, during the first trimester. The incidence rate among mothers supervised by physicians was actually higher than the incidence rate among wholly unsupervised mothers and, likewise, higher, if less so, among the group supervised by nurses. It is not unlikely that the abnormality developing foetus would, in many cases, produce symptoms in the mother which would have the effect of bringing a higher proportion of them to a nurse or physician for advice. Routine pre-natal care was conspicuously ineffective. The hint conveyed in the preceding paragraph may indicate how pre-natal guidance might be made more effective if the hypothesis could be substantiated.

Adequacy of maternal nutrition and congenital defects

There was an unexpectedly marked difference between the incidence rates of congenital defects among children of adequately nourished mothers and those poorly fed. The poorly fed mothers bore almost twice as many defective children, relatively speaking, than the well fed mothers. However, good nutrition failed to prevent both the monstrosities and three of the five cases of spina bifida. The incidence of all other types of abnormalities, except cleft palate, was distinctly greater in the undernourished group. Unfortunately, because of deficiencies in some of the other data necessary, a more comprehensive study of this aspect of the problem could not be made.

In summary, the incidence of congenital defects amongst Indians, particularly of the neurological system and the bones and joints, seemed to be rather high. It was particularly high among the first and second born children of mothers under the age of 20 years, lowest among children of mothers in their twenties and increased with increasing age from 30 upwards. Certain age groups may be at special risk of having children with specific types of defects. The incidence rate increased after the fourth child. There is some evidence that the late spring and summer activities of Indian women may affect their chances of having a healthy normal baby, depending on what trimester of gestation is affected. Current pre-natal supervision is wholly ineffective in influencing this particular problem. Good nutrition appears to have a beneficial influence but the association might not be direct.

COMPLICATED DELIVERIES

Incidence rate

The documentation of complications was, like that of congenital defects, more than usually complete, the nurses obviously having gone to considerable pains to collect all relevant data in each case coming to their notice.

The total recorded number of complicated births gave an incidence rate of 96.11 per 1000 births. The incidence of placenta praevia was 8.75 per 1000, retained placenta was 7.32 per 1000 births, other haemorrhages 14.47. The overall incidence of abnormalities of the bony pelvis was 3.75 per 1000 mothers and disproportion or malposition occurred in 9.29 cases per 1000. Labour was unduly prolonged in 4.64 of every 1000 births. Perineal laceration occurred in nearly 3% of births and other unspecified traumata or complications occurred in another 2% of all births. Apart from perineal tears, the most common complication was haemorrhage. Disproportion or malposition was the next most frequent complication.

Incidence of complications by age of mother

The overall incidence of complications was high among teenaged mothers (111 per 1000). It dropped a little but remained still rather high between ages 20 and 24 years but was significantly lower among mothers aged 25 to 34. Thereafter the incidence of complications as a whole tended to increase again as age advanced. However, it is interesting to note that specific complications affected the various age groups differently. Placenta praevia was relatively infrequent among teenaged mothers and increased as age advanced. The peak incidence was shown among mothers aged 30-34 but the highest incidence for any one year of life was among mothers aged 41. Retained placenta was not infrequent among teenaged mothers but it was comparatively infrequent among mothers aged 25-34. After that age, however, the incidence tended to increase quite rapidly as age increased, the incidence among mothers aged 40-44 being four times that among teenagers and nearly five times the incidence among the 25-34 year old mothers. "Other haemorrhages" followed a somewhat similar pattern, the incidence being least among the 20-24 year old group but rapidly and steadily increasing as age advanced to peak among mothers over 45 years of age. Abnormalities of the bony pelvis, were a specific complication among younger mothers, particularly the 20-24 year olds, and was reported quite infrequently in older age groups, not at all over the age of 40, rarely above the age of 30. The incidence of disproportion and malposition was high among very young and more elderly women, being highest over the age of 45. It has already been noted that many of the more elderly mothers tended to have rather larger infants than younger mothers. The lowest incidence was between the ages of 25-29. Women between 25 and 30 were rarely troubled with unduly prolonged labour but below and especially above those ages the incidence was quite marked. Perineal laceration was markedly a complication among younger mothers, the incidence diminished steadily as age advanced, women over forty being very rarely affected. "Other traumata" were common among teenaged mothers, relatively infrequent in the earlier twenties and thereafter somewhat erratic but affected the 40 year old mothers rather heavily. "Other complications", though affecting all ages, tended to appear more frequently among mothers over 30 and increase with age.

Complicated delivery and birth rank

The highest incidence of complicated deliveries was among the first born (136 per 1000 births). The incidence of complications fell with each successive advance in birth rank up to the fourth child then rose progressively with increasing birth rank. As with the age of the mother, specific complications showed differing patterns of incidence. Placenta praevia was not a major complication among the first born though it was common among the second and fourth born but it did show a marked increase from the 6th child upward and would appear to be a much greater hazard to multipara after their fifth child. Retained placenta, on the other hand, showed no particularly specific predilection for any birth rank. With the exception of second born children, among whom the incidence was low, the incidence rates did not deviate significantly from the mean rate. "Other haemorrhages" affected most lower parity groups to much the same extent also save that they did show a rather higher incidence among third born children but there was a significant rise among eighth and later born children. Abnormalities of the bony pelvis were reported predominantly in primipara, then second and third births, after which it would appear that most mothers suffering from this affliction gave up having children. Presumably a considerable proportion of such mothers would have Caesarian sections or difficult instrumental deliveries and be duly advised on the dangers of further pregnancies. At any rate, Indian mothers with serious deformities of the bony pelvis seem to have been able in the majority of cases to avoid continuing risk after a third

child. Disproportion and malposition was high among primipara, quite low among fourth and fifth deliveries but thereafter rapidly increased and reached peak incidence among sixth born children and continued high among children of greater birth rank. The incidence of prolonged labour was relatively high among primipara, diminished rapidly up to the fourth delivery then began to rise rapidly, peaking at the eighth delivery and continuing high thereafter. Perineal laceration was essentially a complication of first and second births. After the fourth birth the incidence dropped off very rapidly. The incidence of other traumata or complications tended to increase with increasing parity but was high also among primipara. Primipara are obviously always a particularly high risk group but women who have had four or more children previously are also increasingly at risk of having some complication at delivery, particularly placenta praevia, severe haemorrhage, malposition or disproportion, undue prolongation of labour and other complications. It would appear that if a woman has once had a retained placenta she is more than likely to continue to fail to separate and discharge the placenta but multiparity, of itself, does not seem to increase the risk. Multiparity, for obvious reasons, reduces the risk of perineal laceration.

Complications at birth and adequacy of maternal nutrition

It was thought worth examining the data to see if the adequacy or otherwise of the mother's diet reflected any difference on the incidence of complications at delivery. In the overall picture it did not appear to have any effect, the incidence of complications in both well nourished and poorly nourished mothers being almost identical despite the wide difference in numbers included in each group. Unfortunately the analysis is heavily weighted by the large proportion of mothers whose diets were not assessed. So far as the specific complications are concerned there are some interesting differences in the incidence rates but it is doubtful if they are of much significance. For example, abnormalities of the bony pelvis were almost twice as prevalent among the poorly fed mothers as among the well fed group. Disproportion and malposition were commoner. Placenta praevia appeared to be more common and "other unspecified complications" and "other traumata" were definitely more frequent. Retained placenta and haemorrhages, however, if anything, were less frequent in the poorly fed group and, though there appeared to be a tendency for more labours to be prolonged among the under-nourished, as might possibly be expected, the difference is not statistically very significant. Perineal lacerations were quite strikingly less frequent among undernourished mothers and some causative association may exist. It is feasible that prolonged undernourishment might predispose to an unduly small pelvis or produce relatively weak uterine activity which would tend to prolong labour and result in a small foetus that would not cause perineal laceration with the same frequency. It is not so clear how undernourishment might increase a tendency to placenta praevia or disproportion. There might be some association with a tendency towards malposition. The main difference was in the unspecified complications and what, if any, significance this may have would require much more elaborate and precise study. Undernourished women may be more prone to some types of complications but the present data are too crude to be a reliable guide.

Pre-natal supervision and complicated deliveries

In much the same exploratory spirit, the data were also studied with a view to finding what effect, if any, resulted from pre-natal supervision by physicians and nurses. At first glance the effect would seem to have been the opposite of that desired. Nurses supervised 54% of all pregnant women and this group of professionally supervised mothers had 67% of all reported complicated deliveries. The incidence of complicated deliveries among physician-supervised mothers was over 11%, among

Maternal and Child Health Survey 1962
Complications at Birth by Age of Mother

Age of Mother	Total Births	Number of complicated births									
		Placenta praevia	Retained placenta	Other haemorrhage	Abnormal pelvis	Disprop. or mal-position	Prolonged labour	Perineal laceration	Other trauma	Other complications	Total complicated births
Under 15	16	0	1	0	0	0	0	0	0	0	1
15	26	0	0	0	0	0	0	1	0	1	2
16	73	0	0	1	0	0	1	5	0	2	9
17	152	0	1	1	1	1	1	12	0	4	21
18	196	2	3	3	1	3	0	10	0	4	26
19	282	0	0	6	1	4	0	9	1	2	23
15-19	729	2	4	11	3	8	2	37	1	13	81
20	313	0	1	3	0	3	1	17	1	10	36
21	308	3	3	1	2	2	0	16	0	2	29
22	334	1	3	3	3	1	1	8	0	3	23
23	330	4	1	1	3	4	2	7	0	8	30
24	313	3	5	3	2	4	3	17	0	6	43
20-24	1,598	11	13	11	10	14	7	65	1	29	161
25	304	2	3	2	0	0	2	10	0	6	25
26	275	1	1	4	1	2	0	9	0	5	23
27	265	1	1	6	0	1	0	6	1	1	17
28	267	1	1	4	0	2	0	4	1	6	19
29	236	5	0	2	2	3	0	6	0	4	22
25-29	1,347	10	6	18	3	8	2	35	2	22	106
30	234	4	0	1	0	3	0	1	1	1	11
31	207	4	1	8	0	1	0	7	0	2	23
32	186	5	2	3	2	2	2	2	0	5	23
33	152	2	0	5	0	1	2	1	0	4	15
34	173	1	1	2	0	3	0	2	0	2	11
30-34	952	16	4	19	2	10	4	13	1	14	83
35	157	2	1	6	1	3	2	1	0	4	20
36	134	2	2	1	0	0	3	1	0	2	11
37	120	1	3	5	0	2	0	2	0	5	16
38	128	1	2	3	0	1	2	0	1	4	14
39	105	1	0	2	1	0	2	1	0	4	10
35-39	644	7	8	17	2	6	9	5	1	19	71
40	71	0	0	2	0	1	0	0	2	3	8
41	65	2	3	1	0	2	1	0	0	0	9
42	62	1	2	0	0	0	0	1	0	2	6
43	30	0	0	2	0	1	0	0	0	1	4
44	16	0	0	0	0	1	0	0	0	0	1
40-44	244	3	5	5	0	5	1	1	2	6	28
45+	31	0	0	1	0	1	1	0	0	0	5
Unknown	21	0	0	0	1	0	0	1	0	0	2
All ages	5,598	49	41	81	21	52	40	157	8	103	538

Maternal and Child Health Survey 1962
Incidence of Complicated Births by Age of Mother

Age of Mother	Incidence Rate per 100,000 births by Age of Mother									
	Placenta praevia	Retained placenta	Other haemorrhage	Abnormal pelvis	Disproportion or malposition	Prolonged labour	Perineal laceration	Other trauma	Other complications	Total complicated births
Under 15	0	6,250	0	0	0	0	0	0	0	6,250
15	0	0	0	0	0	0	3,846	0	3,846	7,692
16	0	0	1,370	0	0	1,370	6,849	0	2,740	12,329
17	0	658	658	658	658	658	7,895	0	2,632	13,816
18	1,020	1,531	1,531	510	1,531	0	5,102	0	2,041	13,265
19	0	0	2,128	355	1,418	0	3,191	355	709	8,156
15-19	274	549	1,509	412	1,097	274	5,075	137	1,783	11,111
20	0	319	958	0	958	319	5,431	319	3,194	11,502
21	974	974	325	649	649	0	5,195	0	649	9,416
22	299	898	898	898	299	299	2,395	0	898	6,886
23	1,212	303	303	909	1,212	606	2,121	0	2,424	9,091
24	958	1,597	958	639	1,278	958	5,431	0	1,917	13,738
20-24	688	814	688	626	876	438	4,068	63	1,815	10,075
25	658	987	658	0	0	658	3,289	0	1,974	8,224
26	364	364	1,455	364	727	0	3,273	0	1,818	8,364
27	377	377	2,264	0	377	0	2,264	377	377	6,415
28	375	375	1,498	0	749	0	1,498	375	2,247	7,116
29	2,119	0	847	847	1,271	0	2,542	0	1,695	9,322
25-29	742	445	1,336	223	594	148	2,598	148	1,633	7,869
30	1,709	0	427	0	1,282	0	427	427	427	4,700
31	1,932	483	3,865	0	483	0	3,382	0	966	11,111
32	2,688	1,075	1,613	1,075	1,075	1,075	1,075	0	2,688	12,366
33	1,316	0	3,289	0	658	1,316	658	0	2,632	9,868
34	578	578	1,156	0	1,734	0	1,156	0	1,156	6,358
30-34	1,681	420	1,996	210	1,050	420	1,366	105	1,471	8,718
35	1,274	637	3,822	637	1,911	1,274	637	0	2,548	12,739
36	1,493	1,493	746	0	0	2,239	746	0	1,493	8,209
37	833	2,500	2,500	0	1,667	0	1,667	0	4,167	13,333
38	781	1,563	2,344	0	781	1,563	0	781	3,125	10,938
39	952	0	952	952	0	1,905	952	0	3,810	9,524
35-39	1,087	1,242	2,174	311	932	1,398	776	155	2,950	11,025
40	0	0	2,817	0	1,408	0	0	2,817	4,225	11,268
41	3,077	4,615	1,538	0	3,077	1,538	0	0	0	13,846
42	1,613	3,226	0	0	0	0	1,613	0	3,226	9,677
43	0	0	6,666	0	3,333	0	0	0	3,333	13,333
44	0	0	0	0	6,250	0	0	0	0	6,250
40-44	1,230	2,049	2,049	0	2,049	410	410	820	2,459	11,475
45+	0	0	6,383	0	2,128	2,128	0	0	0	10,638
Unknown	0	0	0	4,762	0	0	4,762	0	0	9,524
All ages	875	732	1,447	375	929	464	2,805	143	1,840	9,611

Maternal and Child Health Survey 1962
Complications at Delivery by Birth Rank of Child

Birth Rank of Child	Total Births	Number of Complications at Delivery									
		Placenta Praevia	Retained Placenta	Other Haemorrhage	Abnormal Bony Pelvis	Disproportion or Malposition	Prolonged Labour	Perineal Laceration	Other Traumata	Other Unspecified Complications	Total Complicated Deliveries
1st child.....	807	1	7	7	10	9	5	52	1	18	110
2nd child.....	759	5	2	8	4	6	3	38	1	12	79
3rd child.....	635	1	6	11	3	6	2	28	0	9	66
4th child.....	649	4	5	5	1	2	1	13	0	9	40
5th child.....	588	3	3	8	1	1	2	9	1	9	37
6th child.....	462	6	3	4	0	7	2	6	0	8	36
7th child.....	408	5	4	4	0	3	0	3	1	9	29
8th child.....	335	4	2	11	2	5	3	2	0	7	36
9th child or more.....	955	20	9	23	0	13	8	6	4	22	105
Grand Total.....	5,598	49	41	81	21	52	26	157	8	103	538

Incidence of Complicated Deliveries by Birth Rank of Child

Birth Rank of Child	Total Births	Incidence Rate per 100,000 Births of Complications at Delivery by Birth Rank of Child									
		Placenta Praevia	Retained Placenta	Other Haemorrhage	Abnormal Bony Pelvis	Disproportion or Malposition	Prolonged Labour	Perineal Laceration	Other Traumata	Other Unspecified Complications	Total Complicated Deliveries
1st child.....	100,000	124	867	867	1,239	1,115	620	6,444	124	2,230	13,630
2nd child	"	659	264	1,054	527	791	395	5,007	132	1,581	10,408
3rd child	"	157	945	1,732	472	945	315	4,409	0	1,417	10,394
4th child	"	616	770	770	154	308	154	2,003	0	1,387	6,163
5th child	"	510	510	1,361	170	170	340	1,531	170	1,531	6,293
6th child	"	1,299	649	866	0	1,515	433	1,299	0	1,732	7,792
7th child	"	1,225	980	980	0	735	0	735	245	2,206	7,108
8th child	"	1,194	597	3,284	597	1,493	896	597	0	2,090	10,746
9th child	"	2,094	942	2,408	0	1,361	838	628	419	2,304	10,994
or more.....	"										
Grand Total.....	100,000	875	732	1,447	375	929	464	2,805	143	1,840	9,611

Maternal and Child Health Survey 1962
Complicated Deliveries by Adequacy of Mother's Diet

Adequacy of Mother's Diet	Total Births	Number of Complicated Deliveries									
		Placenta Praevia	Retained Placenta	Other Hæmorrhage	Abnormal Bony Pelvis	Disproportion or Malposition	Prolonged Labour	Perineal Laceration	Other Traumata	Other Complications	Total Complicated Deliveries
Adequate.....	2,943	22	27	49	10	31	12	114	1	53	319
Inadequate	847	9	7	13	6	12	5	12	4	23	91
Unknown	1,808	18	7	19	5	9	9	31	3	27	128
Total.....	5,598	49	41	81	21	52	26	157	8	103	538

Incidence of Complicated Deliveries by Adequacy of Mother's Diet

Adequacy of Mother's Diet	Total Births	Incidence Rate per 100,000 Births of Complications at Birth by Adequacy of Mother's Diet									
		Placenta Praevia	Retained Placenta	Other Haemorrhage	Abnormal Bony Pelvis	Disproportion or Malposition	Prolonged Labour	Perineal Laceration	Other Traumata	Other Complications	Total Complicated Deliveries
Adequate.....	100,000	748	917	1,665	340	1,053	408	3,874	34	1,801	10,839
Inadequate	"	1,063	826	1,535	708	1,417	590	1,417	472	2,715	10,744
Unknown	"	996	387	1,051	277	498	498	1,715	166	1,493	7,080
Total.....	100,000	875	732	1,447	375	929	464	2,805	143	1,840	9,611

Maternal and Child Health Survey 1962
Complicated Deliveries by Duration of Pre-natal Supervision by a Physician

Period of pre-natal supervision by a physician	Total births	Number of Complicated Deliveries									
		Placenta praevia	Retained placenta	Other haemorrhage	Abnormal bony pelvis	Dispro- portion & malposition	Prolonged labour	Perineal laceration	Other traumata	Other compli- cations	Total compli- cated deliveries
All three trimesters	659	5	2	8	3	7	2	24	0	11	62
2nd and 3rd "	990	8	13	6	6	11	5	42	2	20	113
Subtotal well supervised	1,649	13	15	14	9	18	7	66	2	31	175
1st and 2nd trimesters	25	1	0	1	0	0	0	0	0	2	4
1st " 3rd "	57	1	1	1	1	0	0	3	0	0	7
3rd trimester only	1,088	8	6	18	5	8	4	46	2	27	124
2nd " "	108	1	1	2	0	1	2	2	0	4	13
1st " "	61	1	1	2	0	0	0	2	0	4	10
Subtotal seen late or irregularly	1,339	12	9	24	6	9	6	53	2	37	158
Total supervised	2,988	25	24	38	15	27	13	119	4	68	333
Extent of supervision unknown	584	3	3	8	1	7	4	7	0	6	39
Total reported	3,572	28	27	46	16	34	17	126	4	74	372
Not reported	2,026	21	14	35	5	18	9	31	4	29	166
Total probably not supervised	2,610	24	17	43	6	25	13	38	4	35	205
Grand total	5,598	49	41	81	21	52	26	157	8	103	538

Maternal and Child Health Survey 1962
Incidence of Complicated Deliveries by Duration of Pre-natal Supervision
by a physician

Period of pre-natal supervision by a physician	Incidence Rate per 100,000 births of Complicated Deliveries									
	Placenta previa	Retained placenta	Other haemorrhage	Abnormal bony pelvis	Disproportion & Malposition	Prolonged labour	Perineal laceration	Other traumata	Other complications	Total complicated deliveries
All three trimesters	759	303	1,214	455	1,062	303	3,642	0	1,669	9,408
2nd and 3rd "	808	1,313	606	606	1,111	505	4,242	202	2,020	11,414
Subtotal well supervised	788	910	849	546	1,092	424	4,002	121	1,880	10,612
1st and 2nd trimesters	4,000	0	4,000	0	0	0	0	0	8,000	16,000
1st and 3rd "	1,754	1,754	1,754	1,754	0	0	5,263	0	0	12,281
3rd trimester only	735	551	1,654	459	735	368	4,228	184	2,482	11,397
2nd trimester only	925	925	1,852	0	925	1,852	1,852	0	3,704	12,037
1st "	1,639	1,639	3,279	0	0	0	3,279	0	6,557	16,393
Subtotal seen late or irregularly	896	672	1,792	448	672	448	3,958	149	2,763	11,800
Total supervised	837	803	1,272	500	904	435	3,983	134	2,276	11,145
Extent of supervision unknown	514	514	1,370	171	1,199	685	1,199	0	1,027	6,678
Total reported	784	756	1,288	448	952	476	3,527	112	2,072	10,414
Not reported	1,037	691	1,728	247	888	444	1,530	197	1,431	8,193
Total probably not supervised	920	651	1,648	230	958	498	1,456	153	1,341	7,854
Grand total	875	732	1,447	375	929	464	2,805	143	1,840	9,611

Maternal and Child Health Survey 1962
Complicated Deliveries by Duration of Pre-natal Supervision by a Nurse

Period of Nursing Supervision	Total births	Placenta praevia	Retained placenta	Other haemorrhage	Abnormal bony pelvis	Dispro- portion & Malposition	Prolonged labour	Perineal laceration	Other traumata	Other complica- tions	* Total compli- cated deliveries
All three trimesters	613	5	4	7	5	9	1	25	1	15	72
2nd and 3rd "	1,154	10	16	13	7	13	5	50	2	23	139
Subtotal well supervised.....	1,767	15	20	20	12	22	6	75	3	38	211
1st and 2nd trimesters	40	0	0	0	0	1	1	1	0	2	5
1st and 3rd "	34	1	1	3	1	0	0	2	0	0	8
3rd trimester only	982	8	6	20	4	4	5	39	1	28	115
2nd " "	139	2	0	6	0	1	1	4	0	4	18
3rd " "	53	1	0	1	0	0	0	2	0	2	6
Subtotal supervised late or irregularly.....	1,248	12	7	30	5	6	7	48	1	36	152
Total supervised	3,015	27	27	50	17	28	13	123	4	74	363
Extent of supervision unknown.....	617	4	4	9	1	8	4	11	0	6	47
Total reported	3,632	31	31	59	18	36	17	134	4	80	410
Not reported	1,966	18	10	22	3	16	9	23	4	23	128
Total probably not supervised.....	2,583	22	14	31	4	24	13	34	4	29	175
Grand total	5,598	49	41	81	21	52	26	157	8	103	538

Maternal and Child Health Survey 1962
Incidence of Complicated Deliveries by Duration of Pre-natal Supervision by a Nurse

Period of Nursing Supervision	Incidence rate per 100,000 Births of Complicated Deliveries									
	Placenta praevia	Retained placenta	Other haemorrhage	Abnormal bony pelvis	Disproportion & Malposition	Prolonged labour	Perineal laceration	Other traumata	Other complications	Total complicated deliveries
All three trimesters.....	816	653	1,142	816	1,468	163	4,078	163	2,447	11,746
2nd and 3rd ".....	867	1,386	1,127	606	1,127	433	4,333	173	1,993	12,045
Subtotal well supervised.....	849	1,132	1,132	679	1,245	340	4,244	170	2,151	11,941
1st and 2nd trimesters.....	0	0	0	0	2,500	2,500	2,500	0	5,000	12,500
1st and 3rd ".....	2,941	2,941	8,823	2,941	0	0	5,882	0	0	23,529
3rd trimester only.....	814	611	2,037	407	407	509	3,971	102	2,851	11,710
2nd ".....	1,439	0	4,317	0	719	719	2,878	0	2,878	12,950
1st ".....	1,887	0	1,887	0	0	0	3,774	0	3,774	11,321
Subtotal seen late or irregularly.....	962	561	2,404	401	481	561	3,846	80	2,885	12,179
Total supervised.....	896	896	1,658	563	929	431	4,080	133	2,454	12,040
Extent of supervision unknown.....	648	648	1,459	162	1,297	648	1,783	0	972	7,618
Total reported.....	854	854	1,624	496	991	468	3,689	110	2,203	11,289
Not reported.....	916	509	1,119	153	814	458	1,170	203	1,170	6,511
Total probably not supervised.....	852	542	1,200	155	929	503	1,316	155	1,123	6,775
Grand total.....	875	732	1,447	375	929	464	2,805	143	1,840	9,611

nurse-supervised mothers, 12% as compared with 7% in the presumably unsupervised group. Supervision did not "prevent" complications but, to express the association in another manner, at least 67% of the women who had complications at delivery were under professional supervision and, it is hoped, in many cases the trouble had been detected in advance and steps taken to ameliorate it. For example, the incidence of abnormalities of the bony pelvis was high among physician-supervised women and relatively low in the unsupervised group, which would suggest that this condition tended to be brought to the attention of physicians fairly early. All of those cases were under the care of a physician during the third trimester, the majority of them had been for at least two trimesters. Physician-supervised mothers had less than average incidence of placenta praevia and haemorrhages. They also showed a slightly lower incidence of prolonged labour but a much higher incidence of perineal laceration. One wonders if there is any association between those two. It will be recalled that the supervised groups had a lower infant mortality than the unsupervised mothers. Now it is apparent this was achieved despite a much higher incidence of complications at delivery. It would seem that the pre-natal services, when accepted, are effective in reducing maternal and child health risk. The group supervised by nurses, though it shows some interesting minor points of difference, does not differ significantly from the physician-supervised group and it is clear that most nurse-supervised mothers were also supervised by physicians.

UTILISATION OF PRE-NATAL SERVICES

Level of reporting

In 32% of reports nothing was recorded in any question on the use made of pre-natal services by the mother, 36% of reports were blank as regards physicians' services, 35% as regards nurses' services. It is unlikely that services given would not be recorded. However the figures are broken down, by age or marital status etc., it will be noted that very consistently one third or more of the women involved were not reported to have made any use of the service. This would seem to suggest that in 1962 at least, the pre-natal services were failing to cover at least one third of the Indian women pregnant. It will also be noted that this group of women, however examined, contributed excessively to both the stillbirths and infant mortality, out of all proportion to their relative numbers, and suffered in other ways more severely than the two thirds who were more fully reported and obviously better known to the reporting nurses. This group, comprising one third of Indian mothers, constitutes the "hard core" chiefly responsible for the high infant mortality. They may be regarded as the index of failure of the pre-natal services. One in every three pregnant women not making use of pre-natal services in the Indian situation, is a matter for serious concern.

Effectiveness of pre-natal services

As was mentioned in the section dealing with mortality among the children, when adequately used, the pre-natal services of physicians and nurses made a very significant difference. Again, however, only about one third of pregnant women made anything like adequate use of pre-natal services, only 12% really full use. Almost one half of those actually using the services did so only late in pregnancy or irregularly. The mortality among the children born to this group, though slightly lower, was not significantly improved. Thus pre-natal supervision was effective when adequately and regularly used during the latter six months of pregnancy but almost ineffective if only used during the last trimester or irregularly. Approximately 70% of women pregnant in 1962 did not have adequate pre-natal supervision and, amongst this group, the still-birth rate was 9 per 1000 births and the infant mortality rate over 91 per

1000 live births. This contrasts sharply with the stillbirth rate of just over 6 per 1000 births and infant mortality rate of less than 54 per 1000 live births experienced by the children of mothers who attended pre-natal clinics for at least the latter two trimesters of their pregnancy. Physician care reduced the infant mortality rate to under 46 per 1000 live births which, although a dramatic improvement, is still very far from being a satisfactory rate. The need to improve both the coverage and quality of pre-natal care is obvious and equally obviously this must be further supported by more intensive infant care following delivery for an indefinitely extended period if the heavy infant mortality is to be brought under control. There are, of course, serious socioeconomic and cultural factors complicating the problem.

Dental services

The reporting on dental attention to pregnant women was extremely poor. Only 25% of reports made any mention of it, 75% were blank. Not 7% of pregnant women were reported to have had any attention. Three quarters of those reported were reported as not known to have had any attention. With reports on only one quarter of the women involved, it is difficult to feel any confidence in the statistics, but if only a quarter of those had attention, the level of coverage was certainly not very satisfactory. However, the fact that 84 women who did have dental attention required repeated and prolonged attention may not be without significance, over 22% of those attended, 58, or 69% of them requiring attention for the full duration of pregnancy. Indian women are not noted for the excellence of their dental health. The program of dental care for pregnant women appeared to be lagging badly in 1962 but much needed.

Pre-natal laboratory tests

The number of pregnant women reported to have had specific laboratory tests made was equally disappointingly low.

<u>Test</u>	<u>Number of women tested</u>	<u>Percentage of all pregnant women reported</u>
Urinalysis	3309	59
Haemoglobin estimation	3312	59
Blood pressure taken	3578	64
W.R. or Khan test	2519	45
R _h Factor determination	1900	34
All pregnant women reported	5598	100

Every woman who attended a pre-natal clinic had urinalysis as the analysis by trimester is identical with the analysis of attendance. Three more had haemoglobin estimations made and still more had their blood pressure read, presumably in their homes but, even so, that only 64% of pregnant women had such a simple test as measuring their blood pressure done does not indicate very effective pre-natal supervision or, alternatively, reflects very careless reporting. Less than half the women pregnant in 1962 had specific blood tests done and in only one third was the R_h factor determined. Presumably these tests were not indicated in every case but this level of coverage does not suggest very enthusiastic public health practice. The pre-natal level of care achieved in 1962 was poor and, in consequence, not very surprisingly, relatively ineffective. However, even if the results still leave something to be desired, when adequate supervision was given it was effective in reducing mortality among the children born.

The analysis of the periods during which tests were done show, that with the exception of taking blood pressures, the tests were closely related

to attendance at the pre-natal clinics. If the figures are re-arranged to show the total attendances at clinics during the various trimesters the following picture is presented:

Period of pregnancy	Number of pregnant women					
	Attending clinics	Having urinalysis	Having Hb estimation	Having B.P. taken	Having W.R. or Khan tests	Having Rh factor determined
1st trimester	845	845	815	906	440	286
2nd "	1883	1883	1807	2092	991	745
3rd "	3049	3049	2833	3279	1402	1012

Expressed as percentages of the 5598 women reported to have been pregnant in 1962, these figures appear as:

Period of pregnancy	Percentage of all mothers					
	Attending clinics	Having urinalysis	Having Hb estimation	Having B.P. taken	Having W.R. or Khan tests	Having Rh factor determined
1st trimester	15%	15%	15%	16%	8%	5%
2nd "	34%	34%	32%	37%	18%	13%
3rd "	54%	54%	51%	59%	25%	18%

Expressed as percentages of the mothers attending the clinics during these periods in their pregnancy, the following appears:

Period of pregnancy	Percentage of attenders at clinics				
	Having urinalysis	Having Hb estimation	Having B.P. taken	Having W.R. or Kahn tests	Having Rh factor determined
1st trimester	100%	96%	107%	52%	34%
2nd "	100%	96%	111%	53%	40%
3rd "	100%	93%	108%	46%	33%

Only the taking of blood pressures suggests some home visiting was being done and it is surprising that only about half of those attending clinics had their blood tested for specific disease.

Effect of taking pre-natal capsules

Of the 2346 women reported to have taken pre-natal capsules at some time during their pregnancy, the haemoglobin level was reported only once in 1,271 cases or 54% of the total. This makes any analysis of the effect these capsules may have had on their haemoglobin levels somewhat futile but, for what it is worth, the following results were tabulated:

	<u>Numbers</u>	<u>Percentage</u>
Haemoglobin levels rose in	447	51%
" " fell in	246	28%
" " rose then fell in	25	3%
" " fell then rose in	49	6%
" " remained unchanged in	102	12%
Total reported	869	100%

Thus, some 57% appear to have derived some benefit but 12% showed no improvement and, in 31% of cases, the haemoglobin level actually declined.

Haemoglobin levels were reported serially in a further 46 women believed not to be taking capsules. Among those, the following results were noted:

	<u>Numbers</u>	<u>Percentage</u>
Haemoglobin levels rose in	24	52%
" " fell "	17	38%
" " rose then fell	2	4%
" " fell then rose	1	2%
" " remained unchanged in	2	4%
Total reported	46	100%

Haemoglobin levels improved in 54% of cases without the benefit of pre-natal capsules. They fell in 42% as against 31% of those taking the capsules. The capsules may therefore have prevented some declines and improved a few levels but the effect was almost insignificant.

Utilisation of pre-natal services and marriage status of mother

Married women tended to make earlier and fuller use of pre-natal services. Over 34% of married women had come under nursing care by the second trimester and continued to attend classes thereafter as against less than one quarter of the unmarried mothers. This is understandable but it is the unmarried mothers who stand in the greater need. Women living in common law relationships tended to appear only towards the end of pregnancy, most of them not until the third trimester. They did however tend to report earlier to a nurse than to a physician's clinic as did also the unmarried mothers. This suggests that a woman's social status as a married woman, even among Indians, where it is not supposed to matter so much, does raise some psychological barrier against making her condition known to "the authorities". It is a factor in accepting pre-natal care and the nurses are in the best position to overcome this aspect of the problem. It would appear that they are more apt to win the confidence of the diffident but it is also evident that much more effort must be put into finding the pregnant women earlier in pregnancy. That only 34% of married women came under pre-natal care early enough and consistently enough to be considered really adequate is not satisfactory.

Utilisation of pre-natal services and age of mother

Women between the ages of 25-39 were the most ready to make proper use of available services, some 35% of them coming and staying under regular supervision by the second trimester as against only some 24% of women over 40. The older women were quite diffident about pre-natal services, only 40% of them ever did accept services at any time as against 58% of women aged 35-39. This probably reflects conservative Indian cultural attitudes more than anything else. However, under the age of 25 years, the proportion of women making proper and timely use of the services also dropped to just over 30%, indeed not quite 52% ever did make any use of the pre-natal services. Girls under the age of 15 did rather better, 37% of them were under continuous care from the second trimester onward and another 19% came under control in the third trimester but it is disappointing that one of the sixteen dropped out after the second trimester and six of them were never known to have been under any pre-natal care. These juvenile mothers were the most in need of care of any mothers and seven out of sixteen was a high proportion to escape care. Also, only eight of the sixteen were ever seen by a physician before delivery. Only 55% of other teenaged mothers were referred

Maternal and Child Health Survey 1962
Analysis of Utilization of Pre-natal Services Professional

Period of Utilization of pre-natal services	Attended Pre-natal Clinics		Supervised by a Physician		Supervised by a Nurse		Received Dental Attention	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All three trimesters	679	12.13	659	11.77	613	10.95	58	1.04
2nd and 3rd trimesters	1,024	18.29	990	17.68	1,154	20.61	18	0.32
Subtotal utilising services well	1,703	30.42	1,649	29.46	1,767	31.56	76	1.36
1st and 2nd trimesters	24	0.43	25	0.45	40	0.71	4	0.07
1st and 3rd "	62	1.11	57	1.02	34	0.61	4	0.07
3rd trimester only	1,284	22.94	1,088	19.44	982	17.54	130	2.32
2nd "	156	2.79	108	1.93	139	2.48	108	1.93
1st "	80	1.43	61	1.09	53	0.95	52	0.93
Subtotal, irregular or late use	1,606	28.69	1,339	23.92	1,248	22.29	298	5.32
Total utilising services	3,309	59.11	2,988	53.38	3,015	53.86	374	6.68
If services used, when unknown	497	8.88	584	10.43	617	11.02	1,067	19.06
Total reported	3,806	67.99	3,572	63.81	3,632	64.88	1,441	25.74
Not reported	1,792	32.01	2,026	36.19	1,966	35.12	4,157	74.26
Total probably not using services	2,289	40.89	2,610	46.62	2,583	46.14	5,224	93.32
Grand total	5,598	100.00	5,598	100.00	5,598	100.00	5,598	100.00

Maternal and Child Health Survey 1962
 Analysis of Utilisation of Pre-Natal Services by Duration of Use
 Effect on Child Mortality

Period of pre-natal supervision	Actual Numbers			Percentage Distribution			Mortality Rates	
	Births		Mortality	Births		Mortality	Stillbirths per 1000 total births	Infant mortality per 1000 live births
	All births	Born alive		All births	Born alive			
Supervised by a physician for 6 mths. or more.....	1,640	1,639	10	29	30	22	6.06	45.76
Supervised by a nurse for 6 mths. or more	1,767	1,757	10	32	32	22	5.66	60.33
Attended pre-natal clinics " " "	1,703	1,692	11	30	30	24	6.46	53.78
Supervised by a physician late or irregularly.....	1,339	1,328	11	24	24	24	8.22	71.54
Supervised by a nurse late or irregularly	1,248	1,235	13	22	22	28	10.42	83.40
Attended pre-natal clinics late or irregularly	1,606	1,595	11	29	29	24	6.85	75.24
No supervision by a physician known.....	2,610	2,585	25	47	47	54	9.58	106.00
" " " nurse "	2,583	2,560	23	46	46	50	8.90	90.98
Not known to have attended a clinic.....	2,289	2,265	24	41	41	52	10.48	102.87

Maternal and Child Health Survey 1962
Analysis of Utilisation of Pre-natal Services
Laboratory Tests Performed

Period during which test done	Urinalysis		Haemoglobin Estimation		Blood Pressure		W.R. or Khan Tests		Rh Factor Determination	
	Number	Percentage of all mothers	Number	Percentage of all mothers	Number	Percentage of all mothers	Number	Percentage of all mothers	Number	Percentage of all mothers
All three trimesters.....	679	12.13	531	9.49	736	13.15	53	0.95	30	0.54
2nd and 3rd "	1,024	18.29	947	16.92	1,145	20.45	148	2.64	66	1.18
1st and 2nd "	24	0.43	33	0.59	32	0.57	5	0.09	4	0.07
1st and 3rd "	62	1.11	101	1.80	50	0.89	55	0.98	13	0.23
3rd trimester only	1,284	22.94	1,254	22.40	1,348	24.08	1,146	20.47	903	16.13
2nd "	156	2.79	296	5.29	179	3.20	785	14.02	645	11.52
1st "	80	1.43	150	2.68	88	1.57	327	5.84	239	4.27
Total tested.....	3,309	59.11	3,312	59.16	3,578	63.92	2,519	45.00	1,900	33.94
Reported as not tested.....	497	8.88	466	8.32	461	8.24	584	10.43	670	11.97
Not reported probably not tested.....	1,792	32.01	1,820	32.51	1,559	27.85	2,495	44.57	3,028	54.09
Total probably not tested.....	2,289	40.89	2,286	40.84	2,020	36.08	3,079	55.00	3,698	66.06
Grand Total	5,598	100.00	5,598	100.00	5,598	100.00	5,598	100.00	5,598	100.00

Maternal and Child Health Survey 1962
Analysis of Utilisation of Pre-natal Services by Marital Status of Mother
Physicians Services

Period of utilisation of Physician's services	Single Mothers		Married		Widowed		Divorced		Separated		Common Law	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All three trimesters	90	7.22	555	13.44	3	5.88	0	0	3	6.67	8	7.27
2nd and 3rd "	196	15.72	758	18.36	9	17.65	1	33.33	13	28.89	12	10.91
Subtotal of good utilisers	286	22.94	1,313	31.81	12	23.53	1	33.33	16	35.56	20	18.18
1st and 2nd trimesters	6	0.48	19	0.46	0	0	0	0	0	0	0	0
1st and 3rd "	10	0.80	44	1.07	0	0	0	0	1	2.22	2	1.82
3rd trimester only	297	23.82	743	18.00	14	27.45	0	0	5	11.11	25	22.73
2nd "	38	3.05	67	1.62	0	0	0	0	1	2.22	2	1.82
1st "	13	1.04	45	1.09	1	1.96	0	0	1	2.22	0	0
Subtotal irregular or late use	364	29.19	918	22.24	15	29.41	0	0	8	17.78	29	26.36
Total utilisers	650	52.13	2,231	54.05	27	52.94	1	33.33	24	53.33	49	44.55
If used, when unknown	199	15.96	346	8.38	7	13.73	0	0	9	20.00	18	16.36
Total reported	849	68.08	2,577	62.43	34	66.67	1	33.33	33	73.33	67	60.91
Not reported	398	31.92	1,551	37.57	17	33.33	2	66.67	12	26.67	43	39.09
Total probable non-utilisers	597	47.87	1,897	45.95	24	47.06	2	66.67	21	46.67	61	55.45
Grand Total	1,247	100.	4,128	100.	51	100.	3	100.	45	100.	110	100.

Maternal and Child Health Survey 1962
Analysis of Utilisation of Pre-Natal Services by Marital Status of Mother
Nurses' Services

Period of utilisation of Nurses' services	Single Mothers		Married		Widowed		Divorced		Separated		Common Law	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All three trimesters	80	6.42	520	12.60	3	5.88	0	0	6	13.33	4	3.64
2nd and 3rd trimesters	227	18.20	890	21.56	4	7.84	1	33.33	10	22.22	21	19.09
Subtotal of good utilisers	307	24.62	1,410	34.16	7	13.72	1	33.33	16	35.56	25	22.73
1st and 2nd trimesters only	10	0.80	30	0.73	0	0	0	0	0	0	0	0
1st and 3rd trimesters only	6	0.48	26	0.63	0	0	0	0	0	0	2	1.82
3rd trimester only	227	18.20	717	17.37	12	23.53	0	0	4	8.89	18	16.36
2nd trimester only	32	2.57	98	2.37	4	7.84	0	0	1	2.22	4	3.64
1st trimester only	8	0.64	41	0.99	1	1.96	0	0	1	2.22	2	1.82
Subtotal, irregular or late use	283	22.69	912	22.09	17	33.33	0	0	6	13.33	26	23.64
Total utilisers	590	47.31	2,322	56.25	24	47.06	1	33.33	22	48.89	51	46.36
If used, when unknown	213	17.08	362	8.77	6	11.76	0	0	8	17.78	23	20.91
Total reported	803	64.39	2,684	65.02	30	58.82	1	33.33	30	66.67	74	67.27
Not reported	444	35.61	1,444	34.98	21	41.18	2	66.67	15	33.33	36	32.73
Total probable non-utilisers	657	52.69	1,806	43.75	27	52.94	2	66.67	23	51.11	59	53.64
Grand total	1,247	100.	4,128	100.	51	100.	3	100.	45	100.	110	100.

Maternal and Child Health Survey 1962
Analysis of Utilisation of Pre-natal Services by Age of Mother
Physicians' Services

Period of utilisation of physicians' services	Age of Mother Actual Number Utilising Services in Each Group							
	under 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 and over
All three trimesters	2	67	200	156	135	72	23	3
2nd and 3rd "	2	131	296	257	166	100	27	7
Subtotal of good utilisers ...	4	198	496	413	301	172	50	10
1st and 2nd trimesters only	0	5	4	4	6	6	0	0
1st and 3rd " "	1	10	12	15	12	3	4	0
2nd trimester only	2	164	295	251	176	145	42	9
2nd " "	1	17	29	22	19	17	1	2
1st " "	0	9	18	13	13	5	2	1
Subtotal, irregular or late use	4	205	358	305	226	176	49	12
Total utilisers	8	403	845	718	527	348	99	22
If used, when unknown	2	79	169	124	90	71	38	5
Total reported	10	482	1,023	842	617	419	137	27
Not reported	6	247	575	505	335	225	107	20
Total probable non-utilisers .	8	326	744	629	425	296	145	25
Grand Total	16	729	1,598	1,347	952	644	244	47

Maternal and Child Health Survey 1962
Analysis of Utilisation of Pre-natal Services by Age of Mother
Percentage Use of Physicians' Services

Period of utilisation of physicians' services	Percentage of Mothers in each Age Group Making Specified Use of Physicians' Services							
	under 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 and over
All three trimesters	12.50	9.19	12.52	11.58	14.18	11.18	9.43	6.38
2nd and 3rd trimesters	12.50	17.97	18.52	19.08	17.43	15.52	11.07	14.89
Subtotal of good utilisers	25.00	27.16	31.04	30.66	31.62	31.62	20.49	21.28
1st and 2nd trimesters only	0	0.69	0.25	0.30	0.63	0.93	0	0
1st and 3rd trimesters only	6.25	1.37	0.75	1.11	1.26	0.47	1.64	0
3rd trimester only	12.50	22.50	18.46	18.63	18.49	22.52	17.21	19.15
2nd trimester only	6.25	2.33	1.81	1.63	2.00	2.64	0.41	4.26
1st trimester only	0	1.23	1.13	0.97	1.37	0.78	0.82	2.13
Subtotal, irregular or late use	25.00	28.12	22.40	22.64	23.74	27.33	20.08	25.53
Total utilisers	50.00	55.28	53.44	53.30	55.36	54.04	40.57	46.81
If used, when unknown	12.50	10.84	10.58	9.21	9.45	11.02	15.57	10.64
Total reported	62.50	66.12	64.02	62.51	64.81	65.06	56.15	57.45
Not reported	37.50	33.88	35.98	37.49	35.19	34.94	43.85	42.55
Total probable non-utilisers	50.00	44.72	46.56	46.70	44.64	45.96	59.43	53.19
Grand Total	100	100	100	100	100	100	100	100

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Maternal and Child Health Survey 1962
Analysis of Utilisation of Pre-natal Services by Age of Mother
Nurses' Services

Period of utilisation of Nurses' Services	Age of Mother Actual Numbers of Mothers in each Group using Nursing Services							
	under 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 and over
All three trimesters	3	64	189	151	111	73	19	2
2nd and 3rd "	3	133	314	310	190	152	42	9
Subtotal of good utilisers ...	6	197	503	461	301	225	61	11
1st and 2nd trimesters only	1	10	6	9	7	7	0	0
1st and 3rd " "	0	2	12	11	7	2	0	0
3rd trimester only	3	134	260	233	169	120	54	6
2nd " "	0	24	36	26	32	14	6	1
1st " "	0	7	12	11	15	6	1	1
Subtotal, irregular or late use	4	177	326	290	230	149	61	8
Total utilisers	10	374	829	751	531	374	122	19
if used, when unknown	1	93	181	132	99	69	34	3
Total reported	11	467	1,010	883	630	443	156	22
Not reported	5	262	588	464	322	201	88	25
Total probable non-utilisers .	6	355	769	596	421	270	122	28
Grand total	16	729	1,598	1,347	952	644	244	47

Maternal and Child Health Survey 1962
Analysis of Utilisation of Pre-natal Services by Age of Mother
Percentage Use of Nurses' Services

Period of utilisation of Nurses' services	Percentage of Mothers in each Age Group Making Specified Use of Nursing Services Age of Mother							
	under 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 45	45 and over
All three trimesters	18.75	8.78	11.83	11.21	11.66	11.34	7.79	4.26
2nd and 3rd "	18.75	18.24	19.65	23.01	19.96	23.60	17.21	19.15
Subtotal of good utilisers ...	37.50	27.02	31.48	34.22	31.62	34.94	25.00	23.40
1st and 2nd trimesters only	6.25	1.37	0.38	0.67	0.74	1.09	0	0
1st and 3rd " "	0	0.27	0.75	0.82	0.74	0.31	0	0
3rd trimester only	18.75	18.38	16.27	17.30	17.75	18.63	22.13	12.77
2nd " "	0	3.29	2.25	1.93	3.36	2.17	2.46	2.13
1st " "	0	0.96	0.75	0.82	1.58	0.93	0.41	2.13
Subtotal, irregular or late use	25.00	24.28	20.40	21.53	24.16	23.14	25.00	17.02
Total utilisers	62.50	51.30	51.88	55.75	55.78	58.07	50.00	40.42
If used, when unknown	6.25	12.76	11.33	9.80	10.40	10.71	13.93	6.38
Total reported	68.75	64.06	63.20	65.55	66.18	68.79	63.93	46.81
Not reported	31.25	35.94	36.79	34.45	33.82	31.21	36.07	53.19
Total probable non-utilisers .	37.50	48.70	48.12	44.25	44.22	41.92	50.00	59.57
Grand total	100	100	100	100	100	100	100	100

to physicians. The high rates of complications noted among them are therefore not so surprising and much more attention to these young primipara is very obviously indicated. Although it would appear that by the age of 25 well over half of pregnant Indian women have learnt to make use of services, it still remains a serious matter that well over 40% did not. Much more educational effort is clearly needed. It is not surprising that 60% of Indian women over 45 should be reluctant to adopt "new ways". All of them had borne many children before and the need for any special care is not so apparent to such experienced matrons but, as has been demonstrated, they also are a group at high risk from certain dangers specific to their age and parity. At no age was the level of pre-natal care achieved satisfactory and those age groups standing in greatest need got least. The result is the continuing high mortality rate. This rate, however, was virtually halved among those women who were brought under adequate care.

SUPERVISION IN THE POST-NATAL PERIOD

Maternal post-natal care

If the level of maternal pre-natal care left something to be desired, the level of maternal post-natal care left much more, as the following figures illustrate.

	<u>Number</u>	<u>Percentage</u>
Mothers reported examined in post natal period		
(a) including pelvic examination	1144	20.44
(b) without pelvic examination	666	11.90
(c) examined but details unknown	2	0.03
Total reported examined	1812	32.37
Reported as <u>not</u> examined	2073	37.03
Total reported	3885	69.40
<u>Not reported</u> , probably not examined	1713	30.60
Total probably not examined	3786	67.63
Grand total	5598	100.

Not one third of the women who were reported to have given birth in 1962 had a post-natal examination. Only 20% of all mothers (63% of those examined) had a pelvic examination. Of the other 3786 mothers, 2073 or 55% were definitely known not to have had post-natal checkup. Nothing was reported regarding the remaining 1713 but, in view of the above indications, it is most unlikely that many, if any of them, would have had an examination that escaped being recorded. They would be most unlikely to seek it. The need to improve this aspect of the maternal health services is obvious.

As may be recalled about one third of Indian mothers made reasonably good use of the pre-natal services. It would seem that those using the post-natal services were probably much the same group of women. In other words, it would appear that, by 1962, Medical Services had effectively influenced only about one third of Indian women.

Routine estimation of infant haemoglobin levels was instituted some years ago when it was noted that a high percentage of Indian infants showed very low levels and that such infants had a high hospital admission rate and heavy infant mortality. Specially prepared "paediatric drops" containing iron were introduced for routine administration to these anaemic babies. It was hoped in this study to measure the effectiveness of administering these drops. As already reported earlier in this survey, a dramatic reduction in the infant mortality rates between children getting these drops and those believed not to be having them could be demonstrated, a difference so great that it was most unlikely to be a matter of chance, a difference, moreover, which began to appear after a comparatively short duration of administration and became increasingly greater as the period of administration lengthened. The treated group comprised 2337 infants or 42% of all live births and amongst this group the overall infant mortality rate was 37 per 1000 live births as against the average infant mortality rate for all infants born in 1962 of 80 per 1000 live births and an infant mortality rate of 111 per 1000 live births among the 3215 infants not known to have had the drops.

When an attempt was made to analyse the direct effect on haemoglobin levels, however, it transpired that in only 1139 children or 22% of those surviving to the sixth month of life had two haemoglobin levels been recorded that could be compared and the majority of those showed little or no change. No very clear effect could be demonstrated. Possibly the majority of readings had been taken at too short a time interval. Changes among treated children did not differ significantly from changes in the untreated group which, in any case, in this group of twice recorded children, was too small to afford a useful comparison. It was obvious that these 1139 children were nearly all infants who had been found to be below average at the first estimation and been prescribed drops and the subsequent test failed to demonstrate that the majority of them had as yet derived much benefit. An unconscious bias had probably come into play whereby a group of particularly anaemic children, of particular concern to the nurses because of their low haemoglobin, had been unwittingly selected for double checking and, amongst this type of child, the negligent mother who may be casual about administering drops to her infant regularly, is liable to predominate. The results are disappointing and difficult to reconcile with the apparent dramatic reduction in infant mortality. It was also disappointing that so relatively few infants had had their haemoglobin twice recorded.

For a routine test supposed to be applied to all infants, the level of haemoglobin reporting in general was disappointingly low. In only 2716 infants or barely 49% of all live births was there any report on the infant's haemoglobin level. The best that can be said for this is that it was at least twice as good as the coverage reported for that other procedure supposed to include all infants, smallpox vaccination. In view of the excessive infant mortality in the first month or two of life, which would reduce the number of children who could have been brought under control, it was judged fairer to estimate the levels of coverage in various areas on the estimated number of children likely to have survived to their sixth month of life. Some very interesting differences appear.

It is evident that estimating infant haemoglobin levels was most conscientiously attempted in Central Region, particularly in Norway House Zone where 93% of the infants likely to have survived to their sixth month had at least one haemoglobin estimation reported. However only 31% had two readings reported. Both Sioux Lookout and The Pas Zones reported on over three quarters of the survivors at six months and it is noteworthy that in these Zones, if a nurse had been unable to make an estimation, she reported the haemoglobin level as "unknown". In most

other areas, under such circumstances, the questionnaire was more usually left blank. Coverage in Southern Manitoba, however, was disappointingly and surprisingly low, only 36% but 21% (58% of the tested) were tested twice. In Central Arctic Zone, coverage was very poor, only 8% but, all but one, had been tested twice. This Zone is, of course, one of the most difficult to cover.

The next most successful Region was Pacific Region. Coqualeetza Zone reported haemoglobin levels in 57% of infants likely to have survived to their sixth month and twice on 25%. Nanaimo Zone succeeded in reporting on 69% but twice on only 16%. On the other hand, Miller Bay Zone reported on only 13% and twice on only 2 infants.

Foothills Region came close behind Pacific Region. Coverage was particularly good in Southern Alberta Zone where haemoglobin levels were reported in 70% of children likely to have survived to their sixth month and twice in 45% or 64% of the tested. Yukon Zone reported on 57% but twice in only 19%. The Mackenzie succeeded in covering only 32% but reported twice on 20%. Northern Alberta reported on 47% and twice on 20%.

Ranking fourth, the huge Eastern Region succeeded in reporting on only 49% of survivors to the sixth month. Rather surprisingly perhaps, the James Bay Zone reported the largest coverage, 71% but managed to report twice on only 27%. Southern Ontario reported haemoglobin levels in 64% and twice on 30%. Atlantic Zone reported a slightly better coverage, 68% but reported twice in only 10%. Quebec Zone covered just over one third of their children and reported twice on only 10%. Northern Ontario did not succeed in estimating haemoglobin levels in as many as one quarter of their six month old survivors and reported twice in only 3%. The Eastern Arctic, for much the same reasons as in the Central Northern Zone, succeeded in covering only 14% of the children but reported twice on 11% or 76% of the children tested.

Saskatchewan Region, as a whole, was least successful, succeeding in covering only 40% of survivors to the sixth month but coverage in North Battleford was very good, 77%, 38% twice. Fort Qu'Appelle Zone reported levels in only 34% of cases and twice in only 18%. Prince Albert Zone covered only 28% and reported two readings in only 12%.

These variations are interesting in that they are not entirely explicable in terms of terrain, climate, difficult communications, dispersal etc. Very different results were reported from quite comparable Zones.

Maternal and Child Health Survey 1962
Reporting of Infant Haemoglobin Levels

Region or Zone	Number of children surviving to 6th month of life	Number of Children in each Region and Zone whose haemoglobin level was reported					Not reported	Percentage of Children in each Region and Zone whose haemoglobin level was reported					Not reported
		Once only	Reported twice	Total tested	Reported as "Unknown's"	Total reported		Once only	Reported twice	Total tested	Reported as "Unknown"	Total reported	
Coqualeetza	467	151	116	267	5	272	195	32	25	57	1	58	42
Nanaimo	299	158	47	205	2	207	92	53	16	69	1	69	31
Miller Bay	75	8	2	10	1	11	64	11	3	13	1	15	85
Pacific Region	841	317	165	482	8	490	351	38	20	57	1	58	42
Yukon	74	28	14	42	3	45	29	38	19	57	4	61	39
Mackenzie	229	28	45	73	3	76	153	12	20	32	1	33	67
North Alberta	468	123	95	218	1	219	249	26	20	47	0	47	53
South Alberta	337	86	151	237	0	237	100	26	45	70	0	70	30
Foothills Region	1,108	265	305	570	7	577	531	24	28	51	1	52	48
Prince Albert	203	32	25	57	0	57	146	16	12	28	0	28	72
North Battleford	149	58	57	115	1	116	33	39	38	77	1	78	22
Fort Qu'Appelle	520	88	91	179	9	188	332	17	18	34	2	36	64
Saskatchewan Region	872	178	173	351	10	361	511	20	20	40	1	41	59
South Manitoba	226	34	47	81	0	81	145	15	21	36	0	36	64
Sioux Lookout	241	107	71	178	7	185	56	44	29	74	3	77	23
The Pas	80	49	12	61	8	69	11	61	15	76	10	86	14
Norway House	290	178	91	269	0	269	21	61	31	93	0	93	7
Central Northern	60	1	4	5	5	10	50	2	7	8	8	17	83
Central Region	897	369	225	594	20	614	283	41	25	66	2	68	32
Eastern Arctic	146	5	16	21	27	48	98	3	11	14	18	33	67
Northern Ontario	273	56	9	65	1	66	207	21	3	24	0	24	76
James Bay	246	107	67	174	0	174	72	43	27	71	0	71	29
Southern Ontario	491	166	148	314	3	317	174	34	30	64	1	65	35
Quebec	192	46	19	65	0	65	127	24	10	34	0	34	66
Atlantic	116	67	12	79	0	79	37	58	10	68	0	68	32
Eastern Region	1,464	447	271	718	31	749	715	31	19	49	2	51	49
Unidentified	48	1	0	1	2	3	45	2	0	2	4	6	94
All Regions	5,230	1,577	1,139	2,716	78	2,794	2,436	30	22	52	1	53	47

INFANT GROWTH

Average weight at birth

It is possible to make a rough estimation of the average weight at birth as follows:

<u>Recorded</u> <u>birth weight</u>	<u>Estimated</u> <u>average weight</u>	<u>Number</u> <u>born</u>	<u>Total</u> <u>gross weight</u>
under 3 lbs	2.75 lbs	40	110.0 lbs
3 lbs but under 4 lbs	3.5 lbs	61	213.5 "
4 " " " 5 "	4.5 lbs	152	684.0 "
5 " " " 6 "	5.5 lbs	353	1,941.5 "
6 " " " 7 "	6.5 lbs	1,102	7,163.0 "
7 " " " 8 "	7.5 lbs	1,882	14,115.0 "
8 " " " 9 "	8.5 lbs	1,327	11,279.5 "
9 " " " 10 "	9.5 lbs	513	4,873.5 "
10 lbs or more	10.25 lbs	168	1,722.0 "
Totals		5,598	42,102.0 lbs

If 5,598 infants together weighed 42,102 lbs at birth then the average weight at birth was 7.5 lbs.

Granted that this is but a rough estimate and possibly a little high, there is little evidence to support the hypothesis that Indians have a racial tendency to be smaller than other children at birth. While 1,708 infants were born weighing less than 7 lbs, 2008 or 300 more were born weighing 8 lbs or more, which would suggest that, on the contrary, Indian infants tend to be rather larger than most other infants at birth. It would not, however, be justifiable to make this deduction on the above data. It is more probable that Indian infants are much the same as most human infants and that variations in birth weights are the result of such factors as maternal nutrition, age of mother (possibly associated with diabetic tendencies) and birth rank, etc.

Rate of growth in first year

An attempt was made to study the factors that might possibly exert some influence on the growth of Indian children. The standards by which rates of growth were estimated were those given in the publication, "The Canadian Mother and Child", produced by the Department of National Health and Welfare. Reports on 4312 or 78% of the total were received, assessing the rate of growth by these standards. The results would seem to indicate that 82% of Indian infants gained weight at normal or average rates of growth, some 11% tended to be slow and over 7% gained weight at rates above average.

Level of reporting and nursing supervision

It is interesting to note that, whereas weight gains were reported in 78% of all live births, they were reported in 88% of infants born to mothers who were supervised in the pre-natal period, 90% of the well supervised group and 86% of the late or irregularly supervised, but in only 63% of the group not reported to have any pre-natal supervision, a group comprising some 35% of all pregnant women. That reports on weight gains were reported in only 78% of infants would suggest that some 22% of Indian infants escaped nursing supervision during the first year of their life and the bulk of those were born to women who made little or no use of pre-natal services. There would appear to have been a "hard core" of some 750 Indian mothers or 13% of all pregnant women who escape all forms of health supervision. It will be recalled that 10%

of deliveries were conducted by native midwives and that in another 6% the place and manner of delivery could not be ascertained. It would appear that in 1962, medical services were completely failing to reach at least 13% of Indian mothers and it has been amply demonstrated that this untouched group made a grossly disproportionate contribution to the infant mortality. Failure to keep infants under supervision was probably less than the 22% rate the figures suggest as the reporting of weight gains was subject to infants surviving long enough to make appreciable gains in weight and, as has been shown, mortality in the first few weeks of life was high. It is no mean achievement that as many as 78% of Indian infants were kept under nursing supervision long enough to arrive at some estimation of their rate of growth when all conditions of Indian life and ways are taken into consideration.

Influence on growth rate of pre-natal supervision

It is not likely to be a mere matter of chance that, whereas 82% of Indian infants gained normally as a whole, 85% of infants born to mothers getting good pre-natal supervision did and that less than 8% were slow gainers as compared with 10.7% of all Indian infants. There was no significant difference in the 7% who gained fast. Although the difference is not so great, over 83% of children born to mothers who got late or irregular supervision gained weight normally and the proportion of slow gainers was 9.8% as against the 10.7% average rate. Turning to the group who, in all probability got little or no pre-natal supervision and only 66% of whom were reported, only 78.6% gained normally and 14% were slow gainers. Again, just over 7% were said to have gained weight more rapidly than usual. It has been shown previously that a larger number of smaller babies were born to this group. The deduction to be drawn here is probably not that pre-natal supervision per se directly influenced the child's subsequent rate of growth but that these groups of mothers indicate varying levels of nursing care and willingness to accept advice. The poorest growth results were shown amongst mothers who were not known to have taken the trouble to attend pre-natal clinics, were obviously the most difficult group to contact and keep under supervision and most likely to be the more resistant to accepting advice.

Influence of post-natal supervision

It is clear that a high proportion of weakly infants were referred to physicians as comparing the weight gain rates for physicians with the nurses' record will show. Amongst the group who were not known to have been supervised by either a nurse or physician only 80% gained normally (2% less than amongst those supervised) and 14% were slow in growth (4% more than among supervised infants). There is a suggestion in this table, however, that, if the baby was gaining weight well, either the mother or the nurse tended to cease supervision early, 86% of the babies who were supervised by a nurse for only one month were said to be gaining normally, 9% to be gaining slowly and 4% to be gaining fast. For those who were attended by a physician for only 1 month 85% were gaining normally, 7% were slow and 8% were growing faster than average.

Influence on growth of quality of home care

As might be anticipated, there was a decided difference between the growth rates of children receiving good home care, and those considered by the nurse to be getting poor attention at home. Among well cared for children 88% developed at normal standard rates, 9% gained weight more rapidly than usual and only just over 3% were slow in gaining weight. On the other hand, among children getting poor care, only 72% gained weight at the standard rate and over 22% were slow in gaining weight while only 5.6% gained rapidly. Among children the standard of whose home care was in question, only 76% gained normally,

18% were slow and the same 5.6% gained fast as compared with the averages for all Indian children that year of 82% normal, 10.7% slow and 7% rapid growers.

Influence on growth of various adverse factors

Amongst children in whose homes no adverse factors were reported 87.6% gained weight normally, 4.1% were slower in gaining than usual and 8.3% faster. Among children in whose homes adverse factors were reported to be operating, only 73% gained normally, 22% were slow and 5% gained faster than usual. The differences are most significant.

The factor which most dramatically modified growth rates was illness in the home. Only 60% of children so affected gained normally, 29% were slow in growing but, surprisingly, 11% were fast gainers, presumably because they received special attention from someone. Parental apathy was however much the most depressing factor. Of children so affected only 61% gained normally, 34% were slow in gaining weight and only 5% gained fast. Maternal ill health resulted in 31% of children growing slowly and reduced the average 7% of rapid gainers to under 4%. Improper use of means resulted in only 63% of children gaining normally 30% gaining slowly and 7% grew rapidly in spite of adversity. Abuse of alcohol reduced the percent of normal growers to 67.7% from the average 82%, increased the proportion of slow growers from 11% to 26.4% and reduced fast growers from 7% to 6%. Overcrowding reduced normal growers to 72% and increased slow growth to 23%, only 5% grew faster than usual. Poor housing had almost the identical effect as had also poor sanitation. Unsafe water did not have quite as marked a depressing effect, but only 76% of children in such homes grew at normal rates and nearly 20% were slow in gaining weight, 5% still managed to grow faster than "standard". "Insufficient water", which, it will be recalled, had no effect on the mortality rate was associated with a 77% normal growth rate, 16% slow growth and 7% fast growth, i.e. the rate of growth was retarded but not to anything like the same degree as by the factors mentioned above.

This table is interesting in that weight gains were reported for 88% of all children affected, 91% of children affected by maternal ill health, 85% of homes where alcoholism is the problem. It is evident the nurses were making a vigorous effort to cover the problem homes. The level of reporting for children from homes where no adverse factors were reported was 73%.

Influence of breast feeding on infant growth

Amongst children who were not known to have been breast fed for any appreciable length of time the rates of normal, slow or fast growth were virtually identical with the average rate for the cohort of infants born that year as a whole, 81.9% normal as against 82%, 10.9% as against 10.7% slow, 7.1% as against 7.2% fast gainers, a slight but insignificant lowering of normal and fast rates and rise in slow growers. For children who were breast fed for six months or more, however, the growth rates were 85.5% normal, 5.4% slow gainers, 9% fast gainers, quite a significant increase in normal and rapid growth rates and a considerable drop in the proportion of slow gainers. The same improvement was not shown by children breast fed for less than three months, and, presumably, bottle fed thereafter. Amongst these only 79% gained normally, 14% were slow to gain weight and the average 7% gained fast. Amongst children breast fed for less than six months but more than three months, who would also, most probably, have received some supplementary bottle feeding, the normal weight gain rate was 89%, the slow gainers only 5%, as was also the rate for fast gainers. This spurt in normal weight gaining did not however compensate for the low rate among those breast fed for only one

Maternal and Child Health Survey 1962
Child's Gain in Weight by Duration of Pre-natal Supervision
by a Physician

Period of pre-natal supervision by a physician	Total live births	Reported weight gains		Weight gain reported to be			Incidence per 1,000 reported		
		Total number	Percent of live births in category	"normal"	"below normal"	"above normal"	gained "normally"	gain "below normal"	gain "above normal"
All three trimesters	655	587	90	506	38	43	862	65	73
2nd and 3rd "	984	891	91	752	77	62	844	86	70
Subtotal well supervised	1,639	1,478	90	1,258	115	105	851	78	71
1st and 2nd trimesters	24	16	67	12	3	1	750	188	63
1st and 3rd "	54	48	89	45	2	1	938	42	21
3rd trimester only	1,083	931	86	774	92	65	831	99	70
2nd "	106	89	84	72	11	6	809	124	67
1st "	61	52	85	42	3	7	808	58	135
Subtotal supervised late or irregularly	1,328	1,136	86	945	111	80	832	98	70
Total supervised	2,967	2,614	88	2,203	226	185	843	86	71
Extent of supervision unknown	577	433	75	323	87	23	746	201	53
Total reported	3,544	3,047	86	2,526	313	208	829	103	68
Not reported	2,008	1,265	63	1,011	150	104	799	119	82
Total probably not supervised	2,585	1,698	66	1,334	237	127	786	140	75
Grand total	5,552	4,312	78	3,537	463	312	820	107	72

Maternal and Child Health Survey
Child's Gain in Weight by Duration of Supervision
by a Nurse

Period of pre-natal supervision by a nurse	Total live births	Reported weight gains		Weight gain reported to be			Incidence per 1000 reported		
		Number	Percent of live births in category	"normal"	"below normal"	"above normal"	gained "normally"	gain "below normal"	gain "above normal"
All three trimesters	611	550	90	465	49	36	845	89	65
2nd and 3rd trimesters	1,146	1,036	90	878	89	69	847	86	67
Subtotal well supervised	1,757	1,586	90	1,343	138	105	847	87	66
1st and 2nd trimesters only	39	31	79	25	3	3	806	97	97
1st and 3rd trimesters only	31	28	90	25	1	2	893	36	71
3rd trimester only	979	856	87	709	83	64	828	97	75
2nd trimester only	134	113	84	83	19	11	735	168	97
1st trimester only	52	45	87	38	5	2	844	111	44
Subtotal supervised late or irregularly	1,235	1,073	87	880	111	82	820	103	76
Total supervised	2,992	2,659	89	2,223	249	187	836	94	70
Extent of supervision unknown	611	457	75	340	86	31	744	188	68
Total reported	3,603	3,116	86	2,563	335	218	823	108	70
Not reported	1,949	1,196	61	974	128	94	814	107	79
Total probably not supervised	2,560	1,653	65	1,314	214	125	795	129	76
Grand total	5,552	4,312	78	3,537	463	312	820	107	72

Maternal and Child Health Survey 1962
Child's Gain in Weight by Duration of Post-natal Supervision

Period of post-natal Supervision	Total live births	Reported weight gains		Weight gain reported to be				Incidence per 1,000 reported		
		Number	Percent of live births in category	"normal"	"below normal"	"above normal"		gained "normally"	gain "below normal"	gain "above normal"
Supervised by a physician for 1 mth	228	213	93	181	15	17		850	70	80
Supervised by a physician for 2 mths	236	224	95	181	21	22		808	94	98
Supervised by a physician for 3 mths	179	171	96	136	27	8		795	158	47
Supervised by a physician for 4 mths	111	107	96	85	15	7		794	140	65
Supervised by a physician for 5 mths	65	62	95	54	5	3		871	81	48
Supervised by a physician for 6 mths	120	114	95	92	12	10		807	105	88
Supervised by a physician for 7 mths	24	23	96	19	3	1		826	130	43
Supervised by a physician for 8 mths	57	55	96	42	10	3		764	182	55
Supervised by a physician for 9 mths	29	28	97	22	5	1		786	179	36
Supervised by a physician for 10 mths	60	58	97	48	6	4		828	103	69
Supervised by a physician for 11 mths	10	9	90	7	0	2		778	0	222
Supervised by a physician for 12 mths	459	425	93	361	50	14		849	118	33
Subtotal supervised by physicians	1,578	1,489	94	1,228	169	92		825	113	62
Period of supervision, if any, unknown	3,974	2,823	71	2,309	294	220		818	104	78
Supervised by a nurse for 1 mth	166	143	86	124	13	6		867	91	42
Supervised by a nurse for 2 mths	221	197	89	166	24	7		843	122	36
Supervised by a nurse for 3 mths	236	212	90	170	27	15		802	127	71
Supervised by a nurse for 4 mths	227	212	93	163	30	19		769	141	90
Supervised by a nurse for 5 mths	162	151	93	117	19	15		775	126	99
Supervised by a nurse for 6 mths	377	362	96	295	35	32		815	97	88
Supervised by a nurse for 7 mths	149	147	99	123	13	11		837	88	75
Supervised by a nurse for 8 mths	274	263	96	200	30	33		760	114	125
Supervised by a nurse for 9 mths	222	218	98	182	18	18		835	83	83
Supervised by a nurse for 10 mths	269	262	97	220	23	19		840	88	73
Supervised by a nurse for 11 mths	89	88	99	76	6	6		864	68	68
Supervised by a nurse for 12 mths	1,209	1,164	96	984	102	78		845	88	67
Subtotal supervised by nurses	3,601	3,419	95	2,820	340	259		825	99	76
Period of supervision, if any, unknown	1,951	893	46	717	123	53		803	138	59
Grand total	5,552	4,312	78	3,537	463	312		820	107	72

Maternal and Child Health Survey 1962
Child's Gain in Weight by Quality of Home Care

Quality of Home Care	Total live births	Reported Weight Gains		Weight Gain Reported to be			Incidence per 1000 reported		
		Number	Percent of live births in category	"normal"	"below normal"	"above normal"	gained "normally"	gain "below normal"	gain "above normal"
Adequate	2,328	2,199	94	1,931	75	193	878	34	88
Inadequate	1,756	1,544	88	1,112	346	86	720	224	56
Fair	65	53	82	46	5	2	868	94	38
Not assessed	1,403	516	37	448	37	31	868	72	60
Subtotal probably	3,224	2,113	66	1,606	388	119	760	184	56
Grand total	5,552	4,312	78	3,537	463	312	820	107	72

Maternal and Health Survey 1962
Child's Gain in Weight by Factors Adversely Affecting the Home

Factors affecting the home adversely	Total live births	Reported Weight Gains		Weight Gain Reported to be			Incidence per 1000 reported		
		Number	Percent of live births in category	"normal"	"below normal"	"above normal"	gained "normally"	gain "below normal"	gain "above normal"
Abuse of alcohol	554	470	85	318	124	28	677	264	60
Overcrowding	986	868	88	625	197	46	720	227	53
Poor housing	949	835	88	612	182	41	733	218	49
Poor sanitation	1,018	898	88	646	199	53	719	222	59
Unsafe water	415	370	89	281	72	17	759	195	46
Insufficient water	402	356	89	273	59	24	767	166	67
Parental apathy	634	556	88	339	188	29	610	338	52
Maternal ill health	141	129	91	84	40	5	651	310	39
Other illness in home	115	102	89	61	30	11	598	294	108
Improper use of means	608	537	88	338	162	37	629	302	69
Other unspecified factors	323	281	87	187	72	22	665	256	78
* Total affected by adverse factors	1,835	1,611	88	1,171	351	89	727	218	55
No adverse factors reported	3,717	2,701	73	2,366	112	223	876	41	83
Grand total	5,552	4,312	78	3,537	463	312	820	107	72

* Total affected by adverse factors

No adverse factors reported

Grand total

* This figure is not the sum of those affected by each factor. More than one adverse factor influenced several homes.

Maternal and Child Health Survey 1962
Child's Gain in Weight by Duration of Breast Feeding

Duration of Breast Feeding	Total live births	Reported Weight gains		Weight Gain Reported to be			Incidence per 1,000 reported		
		Number	Percent of live births in category	"normal"	"below normal"	"above normal"	gained "normally"	gain "below normal"	gain "above normal"
Under 1 month	1,821	1,649	91	1,279	249	121	776	151	73
1 month but under 2 months	252	222	88	188	28	6	847	126	27
2 months but under 3 months	246	227	92	185	24	18	815	106	79
Subtotal breast fed for under 3 months	2,319	2,098	91	1,652	301	145	787	143	69
3 months but under 4 months	185	174	94	159	10	5	914	57	29
4 months but under 5 months	134	126	94	111	9	6	881	71	48
5 months but under 6 months	210	203	97	179	8	16	882	39	79
Subtotal breast fed 3 but under 6 months ...	529	503	95	449	27	27	893	54	54
Total breast fed less than 6 months	2,848	2,601	91	2,101	328	172	808	126	66
6 months but under 7 months	67	61	91	52	4	5	852	66	82
7 months or more	937	880	94	753	47	80	856	53	91
Subtotal breast fed for 6 months or more ...	1,004	941	94	805	51	85	855	54	90
Subtotal breast fed for some time	3,852	3,542	92	2,906	379	257	820	107	73
Not known to have been breast fed	1,700	770	45	631	84	55	819	109	71
Grand Total	5,552	4,312	78	3,537	463	312	820	107	72

Maternal and Child Health Survey 1962
Child's Gain in Weight by Weight at Birth

Birth Weight	Total live births	Reported Weight Gains		Weight Gains Reported to be			Incidence per 1000 reported		
		Number	Percent of live births in category	"normal"	"below normal"	"above normal"	gained "normally"	gain "below normal"	gain "above normal"
Under 3 lbs.....	37	4	11	2	2	0	500	500	0
3 lbs but under 4 lbs.....	59	30	51	20	9	1	667	300	33
4 lbs but under 5 lbs.....	147	102	69	61	38	3	598	373	29
5 lbs but under 6 lbs.....	352	261	74	192	60	9	736	230	34
Subtotal weighing less than 6 lbs.....	595	397	67	275	109	13	693	275	32
6 lbs but under 7 lbs.....	1,095	860	79	676	126	58	786	147	67
7 lbs but under 8 lbs.....	1,868	1,465	78	1,239	135	91	846	92	62
8 lbs but under 9 lbs.....	1,322	1,056	80	905	59	92	857	56	87
Subtotal weighing 6 lbs under 9 lbs.....	4,285	3,381	79	2,820	320	241	834	95	71
9 lbs but under 10 lbs.....	507	413	82	344	30	39	833	73	94
10 lbs or more.....	165	121	73	98	4	19	810	33	157
Subtotal weighing 9 lbs or more.....	672	534	79	442	34	58	828	64	109
Grand total.....	5,552	4,312	78	3,537	463	312	820	107	72

Maternal and Child Health Survey 1962
Child's Gain in Weight by Calendar Month and Season of Birth

Calendar Month and Season of Birth	Total Live Births	Reported Weight Gain		Weight gain reported to be			Incidence rate per 1,000 reported		
		Number	Percent of live births in category	"normal"	"below normal"	"above normal"	gained "normally"	gain "below normal"	gain "above normal"
December	376	281	75	239	24	18	851	85	64
January	504	385	76	310	52	23	805	135	60
February	468	361	77	290	42	29	803	116	80
Winter born	1,348	1,027	76	839	118	70	817	115	68
March	520	394	76	323	43	28	820	109	71
April	476	381	80	313	38	30	822	100	79
May	485	391	81	323	38	30	826	97	77
Spring born	1,481	1,166	79	959	119	88	822	102	75
June	507	409	81	327	44	38	800	108	93
July	467	364	78	298	39	27	819	107	74
August	482	375	78	310	37	28	827	99	75
Summer born	1,456	1,148	79	935	120	93	814	105	81
September	415	319	77	259	38	22	812	119	69
October	419	328	78	279	32	17	851	98	52
November	389	311	80	256	36	19	823	116	61
Autumn born	1,223	958	78	794	106	58	829	111	61
Month of birth unknown or not reported	44	13	30	10	0	3	769	0	231
Grand total	5,552	4,312	78	3,537	463	312	820	107	72

or two months, the rates for all children breast fed for less than six months being 80% normal 13% slow 7% fast, i. e. there was an appreciable slowing in gaining weight associated with early abandonment of breast feeding and substituting bottle feeding while prolonged breast feeding markedly improved normal and fast growth and reduced slow growth.

Influence on subsequent growth of birth weight

Children who weighed less than six lbs at birth tended to be slow in gaining weight. Only 3% made rapid gains, 27.5% gained weight less rapidly than normal and only 69% gained weight at the normal rate. Children weighing between 6 and 9 lbs at birth gained weight at slightly above normal rates, 83.4% as against 82% gaining normally, 9.5% as against 10.7% gaining more slowly than normal. Infants weighing over 9 lbs at birth showed only a very slight and insignificantly higher percent of normal weight gainers, a rather lower percent of slow weight gainers (6.4%) and, not so surprisingly, an increase to nearly 11% of rapid weight gains. The infants weighing 4-5 lbs at birth were slowest in picking up weight. Weight gains were reported in only 4 children weighing less than 3 lbs at birth but, as shown previously, the rest died at or shortly after birth.

Influence of the season of birth on growth

The season of birth had very little influence on the subsequent rate of growth of the child save that summer born infants showed some tendency to grow a little faster than the winter born or those born in any other season. Children born in the winter season, particularly in January, tended to be slower in gaining weight than others but the difference is not significant.

This table illustrates also, a well known fact, namely that it is more difficult to keep track of or contact with Indians in the winter. Only 76% of infants born in the winter were successfully followed compared with 79% of the spring and summer born and 78% of the autumn born. Those born in May and June appeared to be the most easily kept under review, 81% were reported.

GENERAL SUMMARY

In 1962, Medical Services were succeeding in reaching only some 75 to 80% of Indian mothers and infants and only barely half of those effectively. There was a "hard core" of at least 13% of mothers and possibly as great as 20% who appeared to escape almost any contact with the Federal Nursing Services. This "hard core" of unreached mothers was the major factor in maintaining the high infant mortality rate but, even when most effective, the maternal and child health services still failed to reduce infant mortality to the level of the Canadian national rate.

There is no evidence that Indians are racially inclined to be smaller at birth than other races but, like others, the size of their infants is liable to the influences of poor nutrition, neglect and ignorance. These factors are more commonly experienced amongst Indians and, in consequence, their children suffer more markedly, reflected most obviously in the high infant mortality rate. However, when available medical services are properly used by the Indians, very marked improvement can be achieved. This has been amply demonstrated. The younger Indian women appear to be making more use of available services than their elders. This is quite understandable, if unfortunate, for the results are clearly shown in the mortality rates.

The older an Indian mother is, the greater would appear to be her risk of having an unusually large child and encountering difficulties in labour. This is probably somewhat offset by the fact that she has probably delivered upwards of 9 children previously, itself carrying the risk of possible gynaecological damage. The apparent tendency for the size of the child to increase with age of mother is interesting and may indicate an undiagnosed prediabetic or mild diabetic condition in the mother, a question worthy of further examination.

While the level of coverage achieved by pre-natal care leaves much to be desired, the level of maternal post-natal care leaves much more. Infant care during the first year of life was much more successful but still far from complete. The level of immunisation achieved was surprisingly and rather disappointingly low in view of the emphasis placed on it.

Attention has been drawn to the evidence that, after the birth of a fourth child, risks of complications and an abnormal birth increase rapidly. Multipara in this category are very liable to feel a little blasé about child bearing and a special effort may be necessary to get such experienced women to accept adequate pre-natal and post-natal care but the evidence of infant mortality indicates it is advisable.

Although the point can not yet be clearly established, there is some reason to suspect Indians may be rather more liable to congenital defects than other Canadians. This would suggest every effort be made to have every birth conducted by competent professional staff preferably in a hospital or nursing station. It is not without significance that the comparatively small number of mothers who were delivered at home by native midwives lost an altogether disproportionate number of infants. When this survey was made, not 80% of Indian births was taking place in hospital.

Some evidence has been demonstrated suggesting that the season of the year in which conception occurs, and the first trimester is passed may have some influence on the probabilities of premature births and congenital defects. This is probably not so much a climatic influence as the influence of the nature of the mothers' activities at that season. Weather conditions did, however, have some influence on the types of morbidity leading to mortality children born at different seasons experienced.

One program exposed by this survey as totally inadequate is the dental program. It would perhaps be more just to say it was inadequate at that time.

Breast feeding for a period of six months was associated with a reduction in infant mortality and marked improvement in the rate of growth pattern. Breast feeding for less than three months, which was a common occurrence, was not associated with the same advantages. Artificial feeding, even when carefully supervised, was not associated with the same degree of improvement either. It would appear that artificial bottle feeding of infants in the Indian situation is difficult to manage and, unless hygienic standards can be markedly improved, should not be encouraged.

The value of Service "pre-natal capsules" has not been demonstrated, when used alone. Used with other supplements, they did appear to have benefit. Infant paediatric drops, on the other hand, appeared to have a very decided beneficial effect, more so than vitamins, which also were beneficial when used over a period of about six months.

The data used in this study are permanently recorded on electronic tape and in store, available for any further examination that might be suggested.

APPENDIX

CHILD AND MATERNAL HEALTH QUESTIONNAIRE INDIAN AND NORTHERN HEALTH SERVICES DEPARTMENT OF NATIONAL HEALTH AND WELFARE

GENERAL		PRENATAL (With Respect to Above Infant)		TRIMESTER	
1. Band Family No.		12. Adequate Diet?	<input type="checkbox"/> Yes <input type="checkbox"/> No	1	2
2. Year of Birth					3
3. Marital Status		13. No. of Months of Care	Medical..... Nursing..... Dental.....		
4. No. of Previous Pregnancies			Urinalysis..... Haemoglobin..... Blood Pressure..... Wasserman or Khan..... RH Factor.....		
5. No. of Live Births		14. Check Tri-mesters in Which Tests Done			
6. No. of Children Living at Home		15. No. of Months in Which Mother	Attended Pre-natal Classes.... Took I.N.H.S. Pre-natal Capsules.... Took Other Supplements (Specify) [.....]		
DELIVERY (With Respect to Above Infant)		16. Haemoglobin			
7. In Hospital By:		POSTNATAL (With Respect to Above Infant)			
Physician..... <input type="checkbox"/>		17. Mother Received Instructions in Care of Infant.....	Yes	No	
Nurse..... <input type="checkbox"/>		18. Mother Received Medical Exam. At End of Involution Period			
8. In Nurs. St'n By:					
Physician..... <input type="checkbox"/>					
Nurse..... <input type="checkbox"/>					
9. At Home By:					
Physician..... <input type="checkbox"/>					
Nurse..... <input type="checkbox"/>					
Native Midwife..... <input type="checkbox"/>					
10. Other					
11. Complications? (Code):					
.....					

Infant's Surname and Given Names:		Father's or Mother's Name:	
Address Other Than Reserve:			
ALL QUESTIONS BELOW REFER TO ABOVE INFANT... DURING HIS FIRST 12 MONTHS			
GENERAL		BIRTH DATA	
19. Agency		30. Delivered in What Month of Pregnancy?	31. If Birth Anomalies, Give Codes [.....]
20. Band			
21. Band Family No.	22. Sex	32. Birth Weight:	34. Weight Gain: <input type="checkbox"/> Normal <input type="checkbox"/> Below Normal <input type="checkbox"/> Above Normal
23. Birth Date	Month Year	33. Haemoglobin: [At 4 Months of Age:..... After 6 Mos. of Age:.....]	
CARE		FEEDING	
24. Did Infant Receive Adequate General Home Care?		35. Number of Months Breast Fed:	37. Were Other Foods Added: Yes No
25. If 'No' to Question 24, Check Contributing Factors:	<input type="checkbox"/> Alcohol <input type="checkbox"/> Poor Housing <input type="checkbox"/> Overcrowding <input type="checkbox"/> Poor Sanitation <input type="checkbox"/> Unsafe Water <input type="checkbox"/> Insufficient Supply <input type="checkbox"/> Ill Health <input type="checkbox"/> Other Illness in Home <input type="checkbox"/> Parental Apathy <input type="checkbox"/> Improper Use of Means <input type="checkbox"/> Other - (Specify).....	36. If Bottle Fed, Was Formula Supervised? <input type="checkbox"/> Yes <input type="checkbox"/> No	At Proper Time..... <input type="checkbox"/> Of Acceptable Quality..... <input type="checkbox"/> In Adequate Amounts..... <input type="checkbox"/>
		38. Number of Months During Which Infant Received: I.N.H.S. Iron Drops..... I.N.H.S. Vitamins.....	39. Other Supplements - (Specify):
IMMUNIZATIONS		DEATHS	
40. Was This Infant Immunized Against:	Partially Yes No	41. Date of Death:	
Diphtheria <input type="checkbox"/>		42. Cause of Death:	<input type="checkbox"/> Respiratory Disease <input type="checkbox"/> G - 1 Disease <input type="checkbox"/> Immaturity <input type="checkbox"/> Accidents <input type="checkbox"/> Communicable Disease for Which Antigen Available <input type="checkbox"/> Other
Pertussis <input type="checkbox"/>			
Tetanus <input type="checkbox"/>			
Poliomyelitis <input type="checkbox"/>			
Smallpox <input type="checkbox"/>			

Child and Maternal Health Questionnaire

The codes to be used for Items No. 11 and No. 31 are those of the International Statistical Classification of Diseases, Injuries and Deaths. Please **specify types of Delivery Complication (No. 11) by inserting one of the numbers 670 and 678 and types of Birth Anomalies (No. 31) by inserting one of the numbers 750 to 759.**

No. 11 – Delivery Complications.

- 670 Delivery complicated by placenta praevia or antepartum haemorrhage.
- 671 Delivery complicated by retained placenta.
- 672 Delivery complicated by other postpartum haemorrhage.
- 673 Delivery complicated by abnormality of bony pelvis.
- 674 Delivery complicated by disproportion or malposition of foetus.
- 675 Delivery complicated by prolonged labour of other origin.
- 676 Delivery with laceration of perineum, without mention of other laceration.
- 677 Delivery with other trauma.
- 678 Delivery with other complications of childbirth.

No. 31 – Birth Anomalies

- 750 Monstrosity.
- 751 Spina bifida and meningocele.
- 752 Congenital hydrocephalus.
- 753 Other congenital malformations of nervous system and sense organs.
- 754 Congenital malformations of circulatory system.
- 755 Cleft palate and harelip.
- 756 Congenital malformations of digestive system.
- 757 Congenital malformations of genito-urinary system.
- 758 Congenital malformations of bone and joint.
- 759 Other and unspecified congenital malformations, not elsewhere classified.



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